PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

MAY
1954

Newport
GLOSS OILS

A complete line of Gloss Oils. Palest and finest. None better.

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REICHHOLD CHEMICAL

"The Saturday Evening Post"—	March 6th...April 3rd...May 1st...June 5th
"Better Homes & Gardens"—	March...April...May...June
"Look"—	March 23rd...April 20th...May 18th...June 15th
"American Home"—	March...April...May...June

* Number of readers of each publication on WALLKYD's advertising schedule multiplied by number of issues in which WALLKYD advertising is currently appearing.

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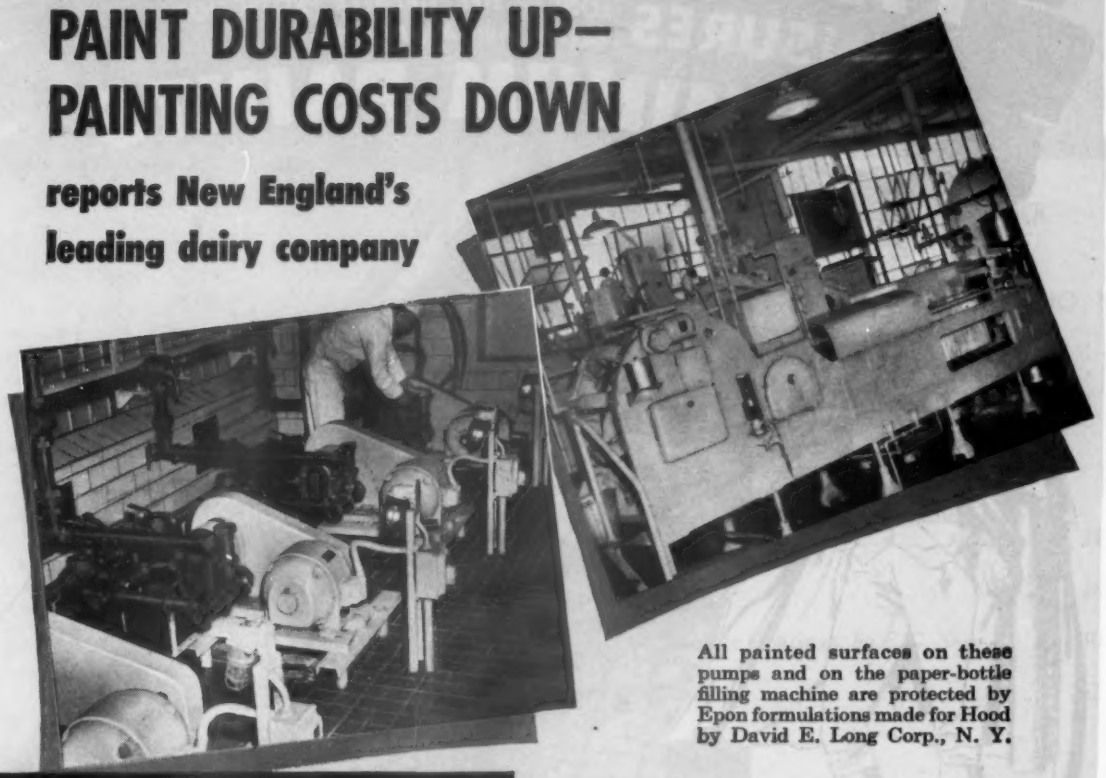
PAINT DURABILITY UP— PAINTING COSTS DOWN

reports New England's leading dairy company



All painted surfaces on these pumps and on the paper-bottle filling machine are protected by Epon formulations made for Hood by David E. Long Corp., N. Y.

HERE'S HOW...

PAINTING is an important part of maintenance in a dairy plant—both for appearance and cleanliness. The paint must meet a wide range of conditions—steamy heat of processing rooms, near-freezing of circulation piping, scouring action of alkalies and detergents.

After conducting patch tests, H. P. Hood & Sons applied Epon resin-based paints experimentally to walls and ceilings of their laboratories, offices, bottling and processing rooms, and on piping and machinery.

The Hood results to date indicate Epon-based paints have these advantages: They can be applied directly to plaster, brick and cement with no special surface preparation. Two coats are adequate to cover any surface. Intervals between paintings are notably lengthened, which means substantial savings in labor and paint.

Paint users are rapidly recognizing the basic advantages of Epon resin-based formulations—excellent adhesion, resistance to abrasion and impact, ability to stand up under heat, humidity, and corrosive atmospheres. Your Shell Chemical representative will explain how Epon resins can improve your own paint and enamel formulations. Literature available for your study is SC:52-31 "Epon Resins for Surface Coatings." Just write or telephone.

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FALKYD A-5-D*

INSURES LONGER LIFE, GREATER PROTECTION BETTER APPEARANCE IN ALUMINUM PAINTS

*Washington Crossing Bridge, Pittsburgh, Pa., was the first major structure in the United States to be painted with aluminum paint (1923-4). It has been repainted only three times since then, in 1934, 1946 and 1953. This bridge is painted with Falkyd Solution A-5-D.

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PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 44 MAY, 1954 NO. 5

NEXT ISSUE

Our June number will carry an interesting article on a research study involving the effect of, and amount and type of excess polyol on the cooking characteristics and film properties of maleic-tall oil alkyds. Storage stability and practical applications of these studies are also discussed.

★ FEATURES

Effect of Lecithin on the Dispersion of Titanium Dioxide in Latex Paints, *by Dr. Max Kronstein* 21

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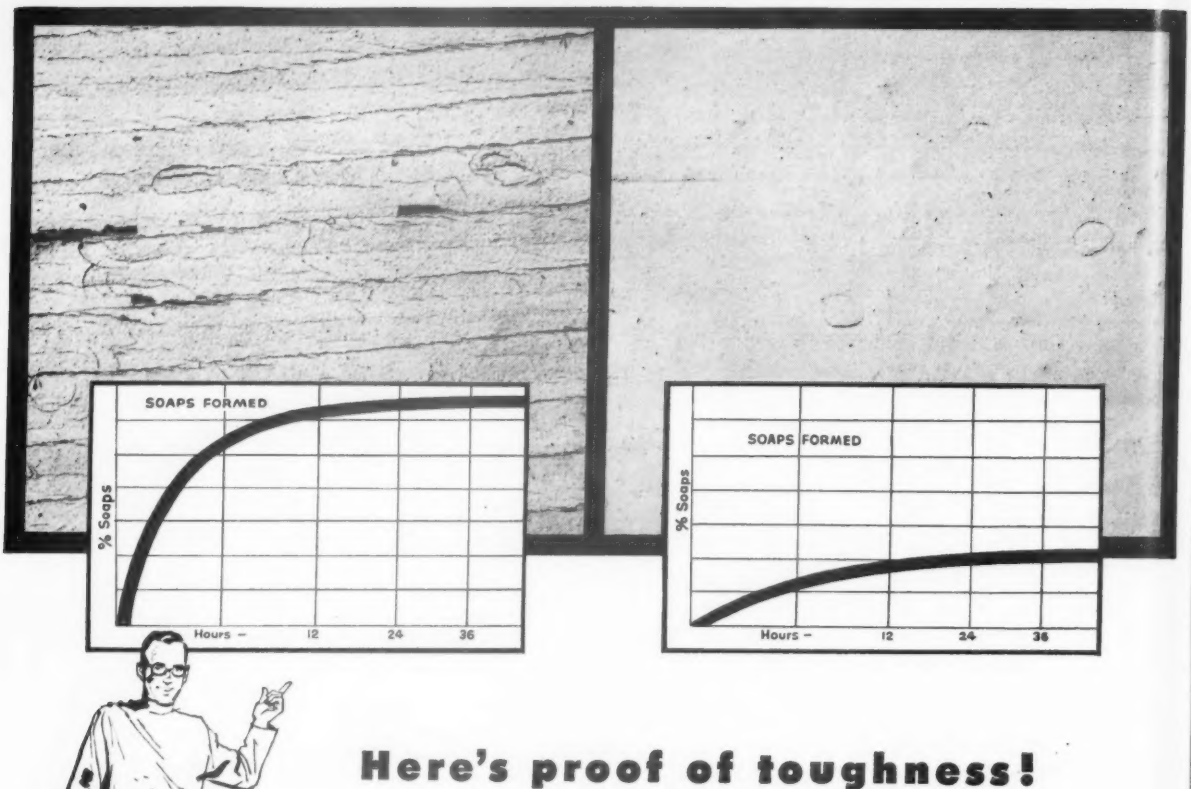

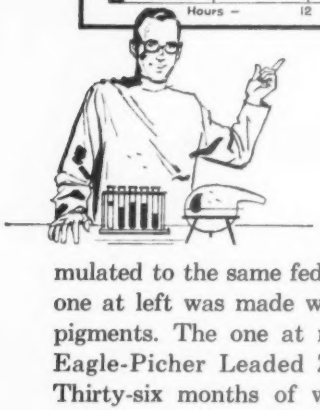

Here's proof of toughness!

Two paints were formulated to the same federal specification. The one at left was made with fast soap-forming pigments. The one at right was made with Eagle-Picher Leaded Zinc Oxide No. 356. Thirty-six months of weather exposure tell the tale . . . prove that rapid soap formation has an adverse effect on film toughness. Pigment reactivity measurements show that a slower rate of chemical reactivity means a tougher paint film.

For most effective control over the rate of soap formation, insist on Eagle-Picher Zinc Oxides.

Remember—Eagle-Picher is the largest manufacturer producing *both* zinc and lead pigments . . . Eagle-Picher backs up its products with unequalled customer service, strict quality control.

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Editorial Comment

May, 1954

Construction and Paint Sales

ONE of the most encouraging bits of news relating to our national economy was a recent announcement that construction awards during the first quarter of 1954 hit an all-time high.

Construction expenditures for the first-quarter totalled $7,300,000,000, according to estimates of the Labor and Commerce Departments. The joint report said that most of the overall increase in March reflected expansion during the month on private housing and public utility construction, plus increased activity in highway work. Total private spending rose 8 percent to about $1,800,000,000. New residential buildings rose by 11 percent in March from February accounting for $854,000,000 and private spending for public utility construction increased slightly during the month to $338,000,000.

George C. Smith of the F. W. Dodge Corp. made this comment—

"Preliminary tabulations of the Dodge reports of construction contract awards in the thirty-seven Eastern states indicate that March awards were far and away the highest ever reported for any March.

"In addition to setting an all-time high for the month, the first quarter of 1954 set a new record for any first quarter in Dodge's sixty-three-year history, since January and February also were at record levels for those months.

"These high March awards are not a fluke but are a continuation of a steady growth in construction activity. The 1953 awards were the highest annual total ever reported by Dodge reports. Seven out of the last twelve months have been at the highest level ever reported for those months.

"These records are not produced by a few large contracts or by any one special branch of construction. They represent high levels of activity in both residential and non-residential fields. It is hard to conceive of a prolonged severe decline in business activity when both individuals and businesses are expressing sufficient confidence in the future to contract for a record volume of construction."

This high level of construction activity will undoubtedly be reflected in the overall sales picture of paints and allied products during the coming months, and should be an important factor in maintaining paint sales well over the billion dollar mark.

Chemical Progress Week

UNDER the sponsorship of the Manufacturing Chemists Association, May 17-24 has been designated "Chemical Progress Week."

The aim of this proposed event is to widen public interest in the chemical industry and to educate the ordinary citizen to an appreciation of what the chemical industry is contributing to America's high standard of living and health.

It is true that the general public has become increasingly conscious of the role that science is playing in their everyday lives, but as a whole, little does it realize the part that science is making to our national economy in creating new businesses and jobs, introducing new and better consumer products at lower costs, conserving our natural resouces, etc. The general public is not familiar with such facts as:

1. The chemical industry is one of the basic industries, like food, steel, petroleum
2. The chemical industry is growing at the rate of 10% a year
3. The chemical industry makes more than 7,000 products, employs over 765,000 people, with an average capital investment of nearly $17,000 per employee
4. The future is limitless.

Those connected with the paint industry must agree that the tremendous strides in coating technology are directly attributed to the growth and progress of the chemical industry. With the introduction of vastly new and improved raw materials, the paint industry is able to provide better coatings for both consumer and industrial use.

It is, therefore, fitting that the paint industry, an important segment of the chemical industry, lend its fullest support to Chemical Progress Week during May 17-24.

SOLTROL*

THINNERS ARE INHERENTLY ODORLESS

Now you can eliminate the pungent smell of ordinary mineral spirits from your line of interior finishes with Soltrol *odorless* thinners.

Both Soltrols are *inherently* odorless.

Physical and chemical properties of these new solvents are well suited to odorless paint formulations.

Available for immediate shipment in 4,000 and 8,000 gallon tank cars.

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End Point	450°F
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Like to test Phillips 66 Soltrols? We'll gladly send you samples for evaluation. Just tell us how much Soltrol you need to prove to yourself the advantages of *odorless* Soltrols in your products.

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NEW PROTECTIVE COATING CHEMICAL FOR ALUMINUM

ALODIZING

Alodizing with "Alodine,"* a new technique in the protective coating of aluminum, was made available for production-scale use in 1946. Since that time Alodizing has largely supplanted the more elaborate, costly and time-consuming anodic treatments in the aircraft and other industries.

Continuous and successful industrial use has clearly demonstrated the simplicity and economy of the Alodizing process as well as the effectiveness of the "Alodine" amorphous coatings, particularly as a base for paint. In fact, the paint-bond that Alodized aluminum provides has been found to be superior to that possible with chromic acid anodizing.

The corrosion-resistance of unpainted aluminum Alodized with "Alodine" Nos. 100 or 300 is excellent, easily meeting the requirements of Specification MIL-C-5541. However, a need for protection of unpainted aluminum, even better than that obtained with chromic acid anodizing, has long been recognized.

NEW IMPROVED "ALODINE" DEVELOPED By ACP RESEARCH CHEMISTS

Several years of intensive research have now led to a new type of "Alodine," designated as "Alodine" No. 1200. This new protective coating chemical forms an amorphous mixed metallic oxide coating of low dielectric resistance that provides unusually high corrosion-resistance for unpainted aluminum. In addition, it forms an excellent paint bond that approaches closely the high quality obtained with the earlier types of "Alodine."

After having been tested for conformance with Specification MIL-C-5541, "Alodine" No. 1200 is now about to go into production.

PROCESS DETAILS

"Alodine" No. 1200 is the only essential chemical needed to prepare the coating bath and the final rinse bath. One of its unique features is that it can be used in tanks in an immersion process, or, in a multi-stage power washer in a spray process, or, with a slight adjustment of pH, with brush or portable spray equipment in a manual process. This means that even where the simple production equipment is not available, or where touching up of damaged coatings previously Alodized or anodized is required, excellent protection and paint bonding can still be obtained with practically no equipment.

All three methods of application easily meet the requirements of Specification MIL-C-5541.

Process sequence for all three methods of application is the same as for other standard grades of "Alodine" such as Nos. 100, 300, and 600, viz.: 1. Pre-cleaning. 2. Rinsing. 3. Alodizing. 4. Rinsing. 5. Acidulated rinsing. 6. Drying.

Coating time in an immersion process ranges from 2 to 8 minutes and in a mechanized spray process is about 30 seconds. "Alodine" No. 1200 baths are operated at room temperatures (70° to 100°F.) and heating is required only if the bath has gotten cold after a "down" period.

RECOMMENDED USES FOR "ALODINE" No. 1200

"Alodine" No. 1200 is specifically recommended for coating wrought products that are not to be painted or are to be only partially painted; and for coating casting and forging alloys whether or not these are to be painted. "Alodine" Nos. 100 and 300 are still recommended for coating wrought products such as venetian blind slats, awnings, etc., that are invariably painted.

RESULTS OF TENSILE TESTS

This new "Alodine" not only retards visible corrosion and pitting, but as shown in the table below, the loss of ductility with "Alodine" No. 1200, both brush and dip, after 1000 hours salt spray was less than for chromic acid anodizing after 250 hours, and for "Alodine" No. 100 and a conventional chromate treatment after 168 hours exposure.

PROCESS	SALT SPRAY EXPOSURE	COMPLIANCE WITH TENSILE REQUIREMENTS OF MIL-C-5541
CHROMIC ACID ANODIZING	168 hrs.	passes
	250 hrs.	passes
	500 hrs.	fails
	1000 hrs.	fails
BRUSH "ALODINE" No. 1200	168 hrs.	passes
	250 hrs.	passes
	500 hrs.	passes
	1000 hrs.	passes
DIP "ALODINE" No. 1200	168 hrs.	passes
	250 hrs.	passes
	500 hrs.	passes
	1000 hrs.	passes
DIP "ALODINE" No. 100	168 hrs.	passes
	250 hrs.	fails
	500 hrs.	fails
	1000 hrs.	fails
CONVENTIONAL CHROMATE TREATMENT	168 hrs.	passes
	250 hrs.	fails
	500 hrs.	fails
	1000 hrs.	fails

*"Alodine" Trade Mark Reg. U. S. Pat. Off.

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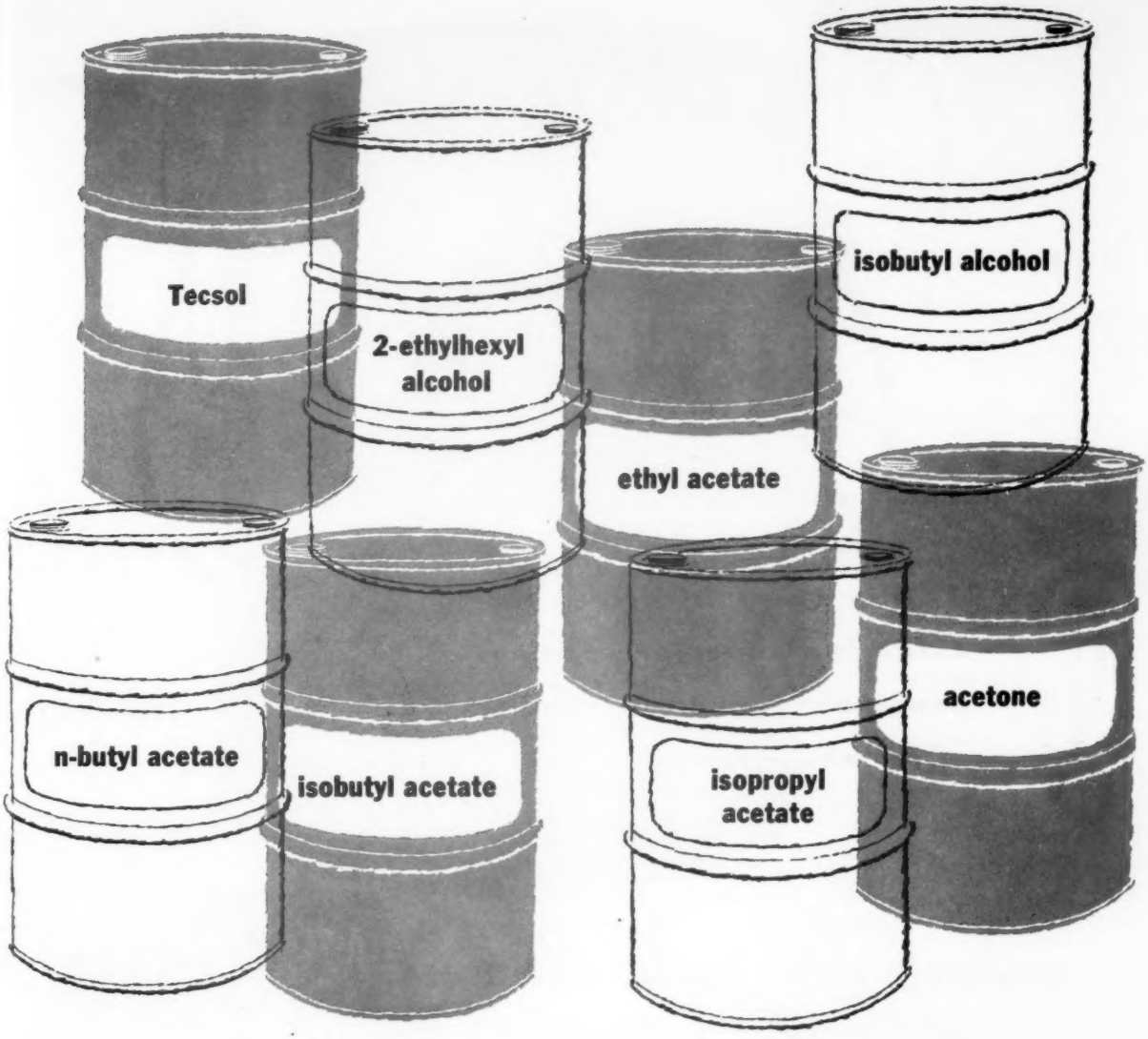

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A high oil absorption Zinc Oxide having large Acicular Particles which gives heavy body

AZO acicular lead-free zinc oxide is a superior pigment available in a wide range of oil absorptions

medium

AZO ZZZ-11

A medium oil absorption Acicular Zinc Oxide imparting exceptional weathering qualities to exterior paints

low

AZO ZZZ-33

A definitely Acicular type with a lower oil absorption, but chemically identical with AZO ZZZ-11 and AZO ZZZ-22

The extra durability, the finer weathering qualities that Acicular Zinc Oxide gives to paint can be obtained with AZO Acicular Zinc Oxides available in a wide range of oil absorptions to meet your requirements

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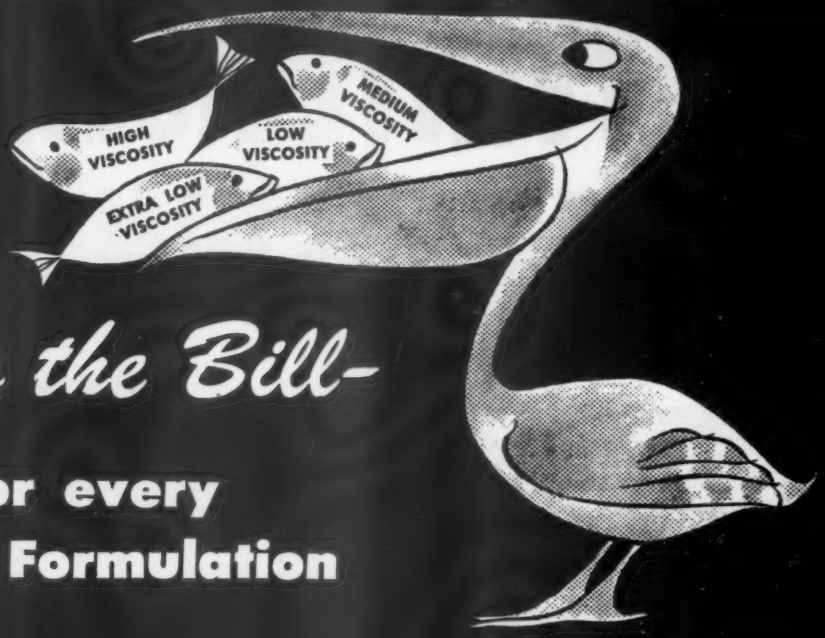

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Use Marbon "9200" MV and LV for General Use.
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POLYVINYL ACETATE EMULSION

for paint

permanence water resistance simple formulation

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PERMANENCE due to polymerizing a plasticizing comonomer with vinyl acetate—instead of adding liquid plasticizer to straight polyvinyl acetate. No evaporation or migration can embrittle film on aging.

WATER RESISTANCE in paints for interior as well as exterior formulations. Films of RESYN 12K-51 on glass withstand 500 wet rubs, compared to 15-50 wet rubs for ordinary polyvinyl acetate emulsion under the same conditions.

SIMPLICITY of formulation—Paint can be made easily with RESYN 12K-51 in regular paint equipment, with high hourly outputs. Yet the formulator has considerable latitude for alterations to suit his own requirements. Formulas and technical help may be obtained by writing to Resin Division, National Starch Products Inc., 270 Madison Ave., New York 16, N. Y.

DATA

Solids — 55%
pH — 4-5
Particle Size — Mostly under 1 micron
Viscosity — 2000-2500 cps.
Water Resistance — Excellent
Films — Clear, flexible, tough, water-resistant

Chemical Progress Week, May 17-22

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National Starch Products Inc.
270 Madison Avenue, New York 16, N. Y.

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Company_____

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City_____ Zone____ State____

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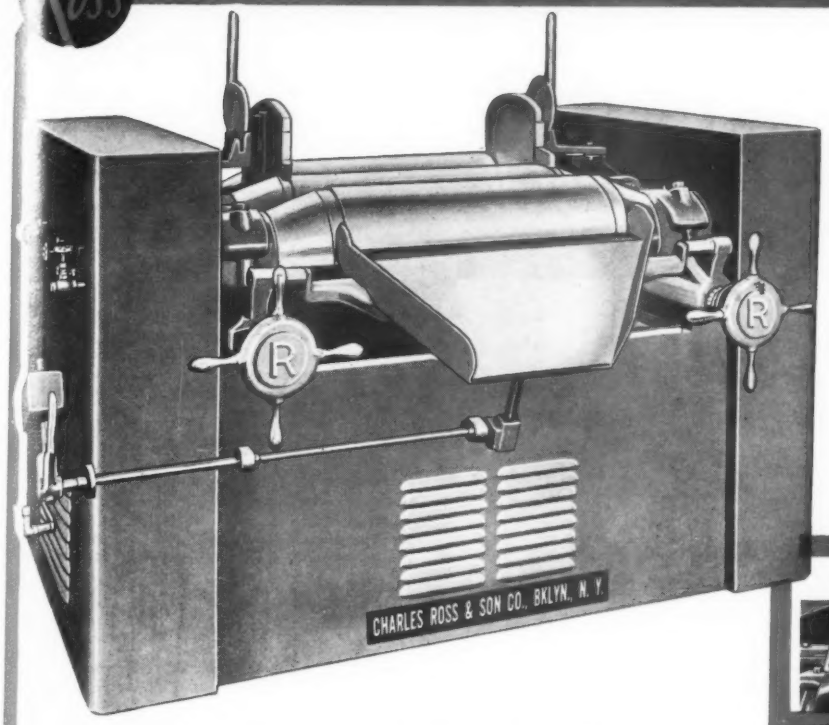
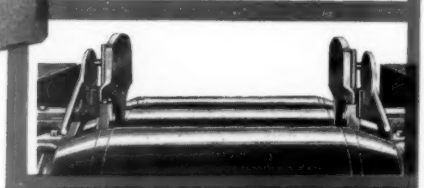


The latest Ross #52TC 14" x 32" High Speed Three Roll Mills are precision engineered and designed for the greatest possible production of high quality dispersions. They will out-perform all other mills of comparable sizes.



The #52TC—14" x 32" Mill, like all Ross Mills, is readily CONVERTIBLE ***for operation either with fixed center roll and four point adjustment or for operation with floating center roll and two point adjustment. To convert from one type operation to the other is easily done within minutes by any operator, without special kits or tools.***

LARGER roll area than any comparative size mill for greater production.

VERSATILE to permit perfect adjustment of rolls, apron, and other parts to meet the various milling requirements of different materials.

RUGGED in construction for dependable trouble-free operation.

Why Ross Mills are preferred by leading plants throughout the country

1. **FRAME** of extra heavy cast iron for rigidity and perfect roll alignment.
2. **ROLLS** of highest quality with extra hard chilled surface, uniform chill depth, and chamber bored for full length cooling. Special high ratio of differential speeds gives greater shear and larger production.
3. **GEARS** extra heavy with wide face helical cut for smooth quiet operation.
4. **BEARINGS** heavy duty SKF self-aligning roller bearings. They carry about one-half their rated load capacity, are tested and guaranteed for all operating conditions.
5. **MOTOR** mounted in Mill frame and lubricated from outside of Mill. Two speed motor when required.
6. **DRIVE** heavy silent chain drive in continuous oil bath lubrication. Chain tension adjustable for efficient power transmission and quiet operation.
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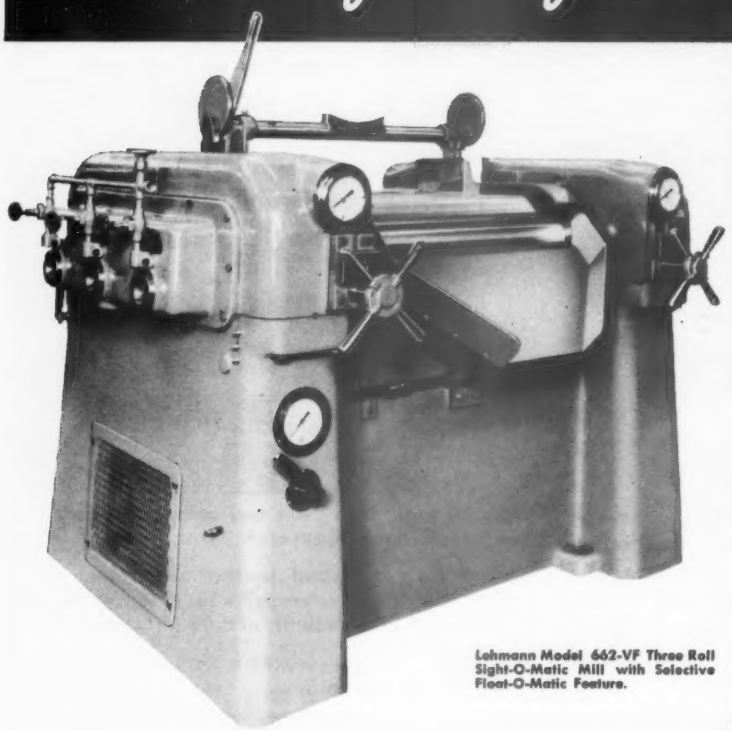

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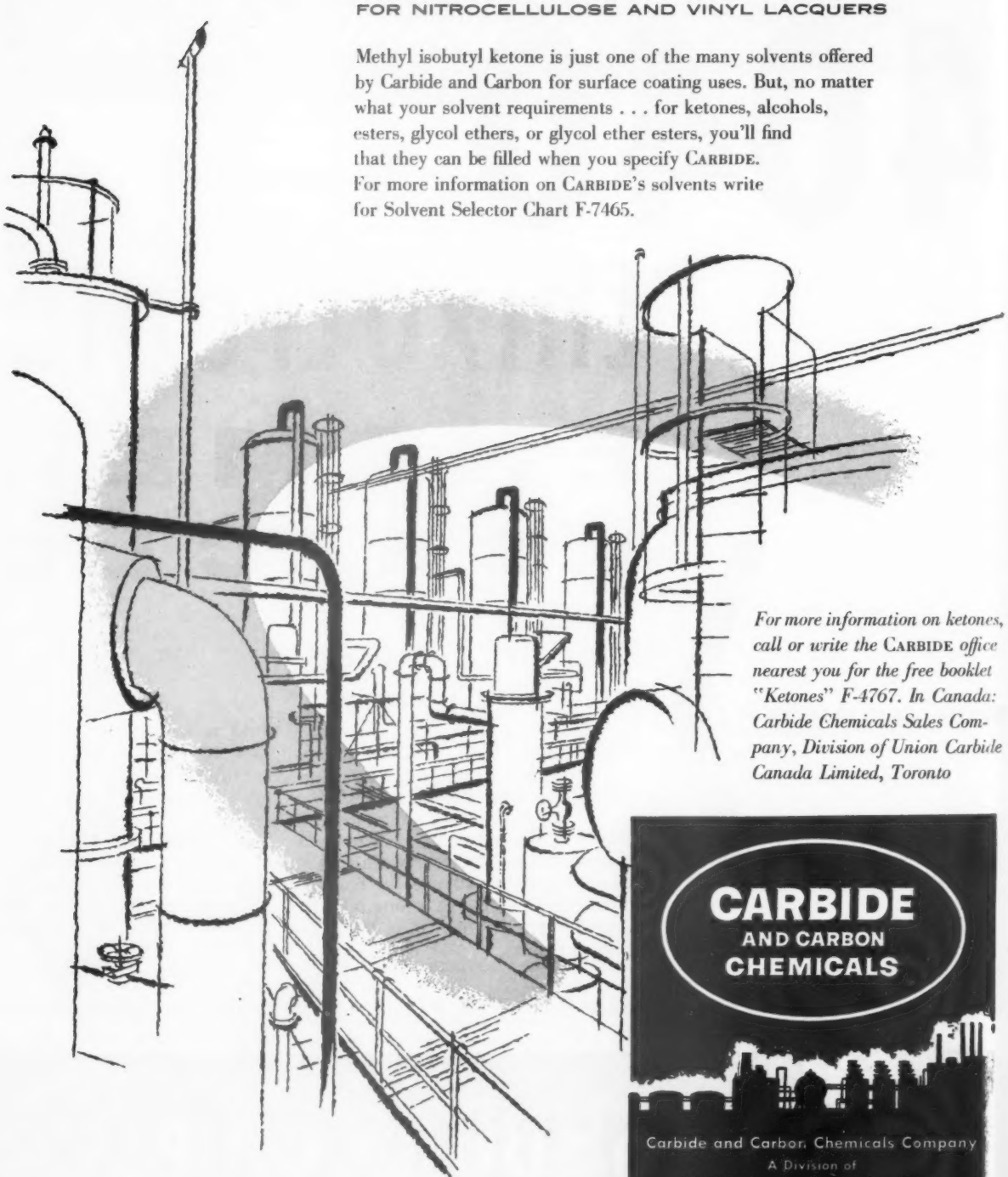

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EFFECT OF LECITHIN ON THE DISPERSION OF TITANIUM DIOXIDE IN LATEX PAINTS

By
Dr. MAX KRONSTEIN
Research Division, College of Engineering
New York University

The general use of lecithin in pigment dispersion is reviewed.

The effect of lecithin on the dispersion of rutile and of anatase titanium dioxide in latex paints was investigated, together with its effect on the behavior of the pH and viscosity of the paint system.

Results show that the use of lecithin in the preparation of paints increases the speed in which pigment dispersion takes place, thus causing the viscosity of the paint to reach a particular level at a faster rate. These paints also show a steady viscosity level during ten weeks of storage. The addition of lecithin to a prepared paint shows less effect on the paint in subsequent storage.

The preferred amount of lecithin employed in these studies was 1% based on the pigment content.

MANY references have been made as to the use of lecithin as a pigment dispersing agent. C. Gardner points out in his paper, "Surface Active Agents in Coatings" (Paint and Varnish Production, Vol. 42, No. 3, March 1952, p. 28-29 and 50) that this material is particularly useful as an aid in the wetting and dispersing of chrome yellow.

Detailed data on the use of lecithin in particular cases are very scarce. In this respect, an interesting work on this material was reported by a technical committee of the *New York Printing Ink Production Club* at the 1946 Washington Convention of the *National Association of Printing Ink Makers* (American Ink Maker, December 1946, p. 29, 31 and 33). This committee studied the effect of lecithin on pastes of non-resinated and of resinated barium lithol toner and used four different vehicles; namely, a litho varnish (linseed oil varnish having viscosity of 18.1 poises and an acid number of 8.3); an alkyd varnish having viscosity of 14.5 poises and acid number of 10.9; an estergum varnish having viscosity of 21.5 poises and acid number of 3.7; and a modified phenolic varnish having viscosity of 29.7 poises and acid number of 4.3.

Each paste was made with 0%, 0.5%, 1% and with 2% lecithin. In the case of 1% lecithin, three procedures were employed:

1. Dispersing lecithin in the vehicle prior to the addition of the pigment.
2. Adding it as an ingredient prior to the grinding.
3. Adding it to the grind after the third run through the mill.

However, this study did not enable the authors to make a general conclusion as to which was the best of the three procedures investigated.

Another detailed study dealing with the influence of lecithin on pigment dispersions was undertaken in France jointly by *M. Fontaine*, director of the *Societe Pro-Ardeco*; *M. Petit*, assistant director of the *Paint and Varnish Research Laboratories*, Belleville, Paris; and *M. Bagot*, chief of the Equipment Service of the ITERG. The results were published partially in Peintures, Pigment, Vernis, Vol. 26, No. 1, January 1950, p. 28-29; and partially in the monthly information bulletin of the ITERG, Vol. IV, No. 1, (1950), p. 5-10.

First, theoretical discussions were given on the various factors which are to be considered in the formation of an oil-pigment paste. These include:

1. The forces of cohesion between the non-dispersed particles.
2. The enclosure of gas absorbed in these aggregates, especially in the case of materials like carbon black.
3. The surface tension of the solid and of the liquid phases.
4. Residual forces, such as electrostatic charges in the pigments which occur during their pulverization, or in their tendency to flocculation.
5. The moisture content which may be absorbed by the pigment.

The lecithin was used to create a surface tension of the solid-liquid phases which approached, as closely as possible, that of a state of complete milling plus an effect caused by the mill itself.

An industrial soybean lecithin was used in the formation of:

1. A black industrial varnish, based on bodied linseed oil/tung oil/phenolic-resin vehicle with a carbon black pigmentation. (The solvent was a mixture of aliphatic hydrocarbons with terpenic ingredients).
2. A white oil paint, and
3. A yellow ochre-linseed oil paint.

In each case, a paste was made with and without lecithin. Then, a paste was made in which lecithin was used while simultaneously increasing the pigment concentration in the paint system.

These authors recommend that, generally, the amount of lecithin should not be greater than an amount to form a monolayer of lecithin on the pigment particles. This amount varies for different pigments between 0.5% and 5% by weight of the pigment. The amount was around 1% in the case of the ordinary lithopones.

With other colored pigments, these authors reported good results with Heliored pigment, using 0.2 to 0.5% lecithin (of total paste).

The authors stated that they did not observe any effect that lecithin had on the drying properties of these paints and they did not have any conclusive data, as yet, concerning the influence of lecithin on the outdoor weathering properties of such paints.

The Scientific Section of the *National Paint, Varnish and Lacquer Association*, in their Circular No. 744 ("System for Determining the Optimum Grinding Composition of Paints in Ball and Pebble Mills" by F. K. Daniel) and in Circular No. 745 ("The Determination of Proper Paint Grinding Formulations for Ball and Pebble Mills" by R. B. Shurts) uses the term "flow point" to express the condition of a paste.

The term is used to indicate a state of fluidity for a paint charge. This is expressed in milliliters of liquid, or solution required for a given amount of a specific pigment in order to form a paste of desired flow. The method for determining this "flow point" and some results with different pigmentations are given in the Circular No. 745.

The influence of certain surface active agents on the flow point was studied by R. Denning and F. K. Daniel. This was presented in a paper at the March Meeting (1953) of the *American Chemical Society* in Los Angeles. The authors were not able to establish general rules for the relation between the surface active agents and different pigment/vehicle systems. However, they proposed the flow point method as a tool for evaluating the dispersing agents for a desired system.

In summary, the references under review have indicated certain desirable effects resulting in the utilization of lecithin (about 1%) for dispersing pigments, and thus has pointed up the practical value of this material in paint systems.

In view of the increasing interest in latex paints, it was decided to extend these findings to a study on the use of lecithin for imparting stability characteristics to white latex paint systems.

These studies are concerned with a) the influence of lecithin on the pH of the system; b) with viscosity changes as they occur in the preparation and the storage of white latex paints, with and without lecithin.

pH Studies

The production of stable latex paints avoids, where possible, changes in the pH which might interfere with the state of the water emulsion. It is necessary that this change should neither occur too quickly when the components are combined; nor develop during storage of the finished paint for certain practical periods of time.

Therefore, a standard formulation was selected and was produced using two different types of titanium dioxide. Each of the two white paints was then combined with different types of lecithin in amounts of 1% or 2%, calculated on the amount of titanium dioxide used. The mixtures were then allowed to stand for several weeks at room temperature.

The pH was measured for the components of the paints individually, and also for the complete paint mixtures. The determinations were made using a Beckman pH meter, Model H-2. The results are given in Tables 1 and 2.

COMPONENT	pH MEASUREMENT
Styrene-Butadiene Latex	9.80
Fungicide in water	11.82
Casein	6.23

Table 1. pH of individual components of white latex paints

PAINT SAMPLE	PIGMENT	LECITHIN	PERCENT CONCENTRATION	AGE OF SAMPLE WHEN TESTED	pH
1 - 0	Titanox A-MO	none	0	5 days	11.05
1 - A	Titanox A-MO	A	1%	6 weeks	10.72
1 - A-Mod.	Titanox A-MO	A modified	1%	5 days	10.95
1 - A-Mod.	Titanox A-MO	A modified	1%	3 weeks	10.90
1 - B	Titanox A-MO	B	1%	17 weeks	10.8
1 - B	Titanox A-MO	B	2%	17 weeks	10.85
1 - C	Titanox A-MO	C	2%	16 weeks	10.3
1 - D	Titanox A-MO	D	2%	14 weeks	10.4
2 - 0	Titanox RA-50	none	0	5 days	10.85 - 10.9
2 - A	Titanox RA-50	A	1%	3 weeks	10.7
2 - A-Mod.	Titanox RA-50	A modified	1%	5 days	10.8
2 - B	Titanox RA-50	B	1%	9 weeks	10.3
2 - C	Titanox RA-50	C	1%	9 weeks	10.2
2 - D	Titanox RA-50	D	1%	6 weeks	10.3

Table 2. pH measurements on white paint formulations made with different types of lecithin in 1% and 2% concentrations.

Materials Used

High Styrene-Butadiene Latex

Commercial Grade of Casein

Fungicide mixture. pH of this mixture was determined by dissolving specified amounts of this mixture in 180 g. of distilled water.

Two types of titanium dioxide (anatase & rutile)

The various types of lecithin which were used are designated A, A-modified, B, C and D. A is a regular commercial soybean lecithin. A-modified is the same product but prepared about 15 hrs. before used by dispersing 3.2 grams lecithin A with 180 grams water and 1 drop ammonium hydroxide to obtain a pH of about 9. B, C and D are commercial water dispersible types of lecithin of different origins.

Paint Mixtures

The two white paint formulations which were used are as follows:

	1) Using TiO_2 (Anatase)	2) Using TiO_2 (Rutile)
Latex	400 grams	400 grams
Fungicide	30 g.	30 g.
Casein	70 g.	70 g.
Water	180 g.	180 g.
Pigment (titanium dioxide)	320 g.	320 g.

Results

The pH of all mixtures was relatively high compared with that of the latex alone. It was evident that the fungicide was the main contributing factor for the increase in pH. In Table 2, comparing the pH of the two base paints without lecithin (paint samples 1-0 and 2-0) with the various samples with lecithin, it appears that the use of lecithin as pigment dispersing agent, according to these samples, in no way disturbed the pH condition of the paints.

The use of regular type lecithin, pre-dispersed in water, with slight addition of ammonium hydroxide gave slightly higher pH than the use of the commercial water dispersible lecithins; but here too, the pH remained within the limits of the same latex paints without lecithin content.

Viscosity Studies

This study is concerned with the effect of lecithins on the dispersion of titanium dioxide in latex-casein-water mixtures.

PART I-PREPARATION OF PAINTS

Test Set-up

The study is concerned with a comparative evaluation of the:

a) Changes in viscosity during the dispersion of the pigment.
b) Changes in this viscosity during one week of storage.
c) Changes in this viscosity during 10 or more additional weeks of storage.

The materials consist of a high styrene-butadiene latex, a commercial grade of casein, a fungicide, and titanium dioxide (anatase and rutile).

Accordingly, the study is presented in two groups of tests based on a) on the anatase dioxide dispersions, b) on the rutile dioxide dispersions.

The studies have been made 1) without lecithin, 2) with 1% water-dispersible type lecithin, using several types of this particular lecithin, 3) with a second water-dispersible type lecithin, added during storage, 4) with 1% regular (non-water-dispersible type) soybean-lecithin.

The percentage of lecithin is based on the percent of pigmentation.

The experimental procedure was as follows:

a. The components for each sample are weighed and placed in a 2-liter beaker and mixed preliminarily with an electrical mixer for about 10 minutes; that is, until the compound is uniformly mixed.

b. The mixer is moved to one side of the beaker and the Brookfield Viscosimeter is immersed in the same beaker. With both instruments operating simultaneously, two readings are taken to the first subject of the study; namely, the change in viscosity during the dispersion of the pigment. These readings are taken for 1 to 2 hours until the viscosity has reached a uniform state for this part of the development.

c. The compound remains at room temperature in a closed container for one week. Then each sample is mixed in the jar for one hour with the electrical mixer using a constant speed to restore uniformity. Then the mixer is removed, and the sample is allowed to stand or "settle" for 15 minutes.

The Brookfield Viscosimeter is immersed directly into the paint jar and readings are taken continuously for one hour to determine the uniformity of the dispersion.
The changes in the viscosity during one week of storage are shown in Part II of this article.

d. The specimens were stored for a period of 10 to 18 weeks; and, at regular intervals, the same procedure was applied as in "c" above. That is, after 1 hour mechanical mixing, the sample was allowed to "settle" for 15 minutes and the uniformity of viscosity conditions was measured during one hour of Brookfield measurements.

In some cases an additional test was made by adding one percent lecithin to the paint after the paints had been stored for 2 or 3 weeks and, after 10 minutes mixing with the mechanical mixer, the change in viscosity was determined for a 1 hour period. Then the paint was again mixed mechanically for 1 hour and the viscosity was once more determined for a 1 hour period.

In these cases the curves are marked as L-1, L-2, L-3 before adding lecithin and as L-1A, L-2A, L-3A after this addition.
The data on the extended storage tests and the changes in viscosity during 10 or more additional weeks are given in Part IV of this article.

e. In a supplementary test all the paints were compared at the end of the series for settling. This "settling test" was done by measuring, after 4 weeks of final storage, the viscosity of the paints 3 inches below the surface before mixing or stirring the paints.
Then the paints were mechanically mixed for 5 minutes, allowed to settle for 5 minutes and the viscosity was measured again.
The viscosity of the fluid before mixing and the final viscosity after mixing were compared.

Paint Formulations

All paints were prepared according to the same standard formulations as used in the studies of the pH conditions.

This base paint was used with and without lecithin.

The lecithins used are listed as I-Water-dispersible lecithin a, and II-Water-dispersible lecithin b, and III-Regular commercial soybean lecithin.

Reporting all paints based on anatase titanium dioxide as Group A, and all paints based on rutile titanium dioxide as Group B, the paints are listed as follows:

Group A

A – O: Base paint with anatase titanium dioxide without lecithin.
A – O – A: Base paint A – O with 1% Lecithin I added after 3 weeks storage.
A – I: Base paint with 1% water-dispersible Lecithin I.
A – I – A: Is paint A – I with additional 1% Lecithin I added after 2 weeks storage.
A – II: Base paint with 1% water-dispersible Lecithin II.
A – II – A: Is paint A – II with 1% additional Lecithin II added after 1 week of storage.
A – III – 1: Base paint with 1% regular soybean lecithin (used as supplied).
A – III – 2: Base paint with 1% regular soybean lecithin (after holding the lecithin overnight is slightly alkaline water).

Group B

B – O: Base paint with rutile titanium dioxide without lecithin.
B – I: Base paint with 1% water-dispersible Lecithin I.
B - II: Base paint with 1% water-dispersible Lecithin II.
B – III – 1: Base paint with 1% regular soybean lecithin (used as supplied).
B – III – 2: Base paint with 1% regular soybean lecithin (after storing the lecithin overnight in slightly alkaline water).

Change in Viscosity during Dispersion of Pigment

The experimental procedure to this has already been described in points a and b of the "Test set-up".

The viscosity readings given in Tables 3 and 4 begin, for the samples without lecithin and with water-dispersible lecithin, after 10 minutes of mechanical mixing of the pigment and the liquid phase. For the samples with regular soybean lecithin with and without overnight preparation of the lecithin in slightly alkaline water, the readings begin after one hour of mechanical mixing and 15 minutes "settling".

Group A Series (anatase Titanium Dioxide NO)

Time of Mixing	Viscosity in Centipoises A-O	A-I	A-II	Time	A-III-1	25°C. A-III-2
1 min.					Constantly mixed for 1 hr. settled 15 minutes and then measured.	
2						
3						
4						
5	Mixing without viscosity measurements.					
6						
7						
8						
9						
10	4900	2050	1850	75 min.	2500	1330
11	5700	2200	1900	76	2500	1360
12	5800	2200	1900	77	2500	1370
13	5800	2200	1900	78	2500	1370
14	5850	2290	1900	79	2500	1370
15	6050	2290	1900	80	2550	1370
16	6120	2300	1900	81	2600	1380
17	5950	2300	1900	82	2600	1380
18	5900	2300	1900	83	2600	1380
19	5850	2400	1900	84	2600	1390
20	6150	2420	1850	85	2600	1390
25	5900	2430	1850	90	2600	1410
30	5650	1900*	1900	95	2650	1410
35	5550	1980	1900	100	2700	1430
40	5500	2150	1900	105	2700	1430
45	5300	2150	-	110	2700	1430
50	5400	2150	1900	115	2700	1430
55	5200	2150	2100	120	2750	1440
60	5200	2230	1950	125	2750	1440
65	5200	2300	1950	130	2750	1440
70	5200	2350	2000	135	2750	1440

*Beaker revolved during mixing.

Table 3. Study of viscosity changes during initial mixing of the liquid phase with titanium dioxide.

Because of this variation in conditions, the results are shown also in three charts as: Chart I, showing samples A – O, A – I, A – II; Chart II, showing B – O, B – I, B – II; Chart III, showing A – III – 1, A – III – 2, B – III – 1, B – III – 2.

Group B Series (rutile Titanium Dioxide RA-50).

Time of Mixing	Viscosity in Centipoises 25°C					
	B-O	B-I	B-II	Time	B-III-1	B-III-2
1	Mixing without viscosity measurements.				Constantly mixed for 1 hour, settled 15 minutes and then measured.	
2						
3						
4						
5						
6						
7						
8						
9						
10	630	460	500	75 min.	460	420
11	630	480	520	76	470	420
12	630	480	520	77	470	420
13	630	480	520	78	470	420
14	630	490	520	79	470	420
15	650	480	520	80	470	420
16	650	480	520	81	470	420
17	650	460	520	82	480	420
18	650	460	510	83	480	420
19	650	460	520	84	470	420
20	660	450	510	85	470	440
25	670	450	520	90	470	420
30	700	440	520	95	480	410
35	710	440	530	100	490	420
40	710	440	520	105	470	430
45	730	440	510	110	470	440
50	760	440	510	115	470	450
55	760	430	530	120	470	450
60	800	450	520	125	470	440
65	800	450	520	130	470	440
70	810	450	510	135	480	450
75	820					
80	880					
85	880					
90	900					
95	900					
100	950					
105	950					
110	1000					
115	950					
120	950					
125	950					
130	950					

Table 4. Studies of viscosity developments during the initial mixing of the liquid phase with titanium dioxide.

The measurements are continued, generally, for 1 hour, except in the case of sample B – O, where a continuing increase in viscosity was studied for an additional hour. Then all specimens were allowed to stay at room temperature for one week for further observation.

Remarks

Earlier in this paper reference was made to study (3) on the influence of lecithin on pigment dispersions, which had been carried out in France. This study showed that oil paint pastes, having the same pigment/oil relation, display a more fluid form when prepared with lecithin than without.

The same finding occurs in the field of latex paints. Table 3 shows the viscosity of new mixes of anatase titanium dioxide with the liquid part of the latex paint and without the use of lecithin (A – O) and with two water-dispersible types lecithin of different origin. (A – I and A – II).

In Table 4, using rutile titanium dioxide, the general level of viscosity is lower, caused possibly by the lower range of particle sizes in the pigment; but here again the fluidity level of the paints with water-dispersible lecithin (B – I and B – II) is:

a) that of a lower viscosity, at constant pigment concentration, than the specimen without lecithin (B – O).

b) also, a more uniform level is reached quicker than without the use of lecithin.

In the case of regular fluid soybean lecithin (not the special water-dispersible type), the results for the rutile titanium dioxide (B – III – 1 and 2) are very comparable to the water-dispersible types. Table 3 shows a certain difference in the use of regular soybean lecithin directly, or after an overngiht conditioning in slightly alkaline water (180 grams water with 1 or 2 drops conc. ammonium hydroxide). It will be shown later in this study that this difference becomes less evident with long periods of storage.

PART II—VISCOSITY CHANGES DURING 1 WEEK OF STORAGE

The viscosity of all paint specimens during their preparation is shown in Charts I, II and III.

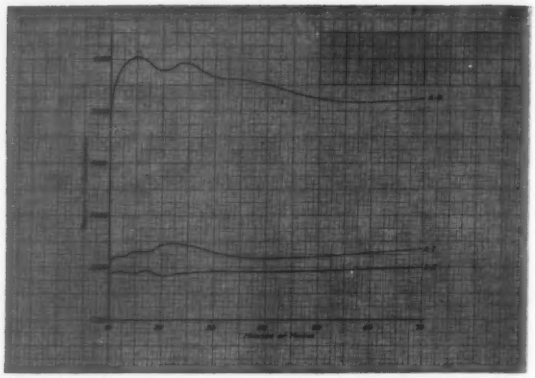

Chart I. Viscosity measurements during the mixing of anatase titanium dioxide with the fluid components without lecithin (A-O) and with two water dispersible lecithins (A-I and A-II). Ordinate: Viscosity in centipoises; Abscissa: Min. of mixing.

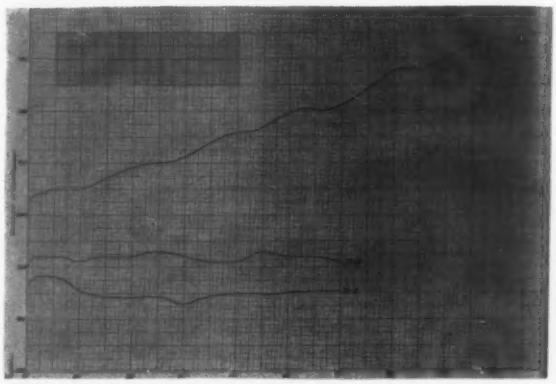

Chart II. Viscosity measurements during the mixing of rutile titanium dioxide with the fluid components without lecithin (B-O) and with two water dispersible lecithins (B-I and B-II) Ordinate: Viscosity in centipoises; Abscissa: Min. of mixing.

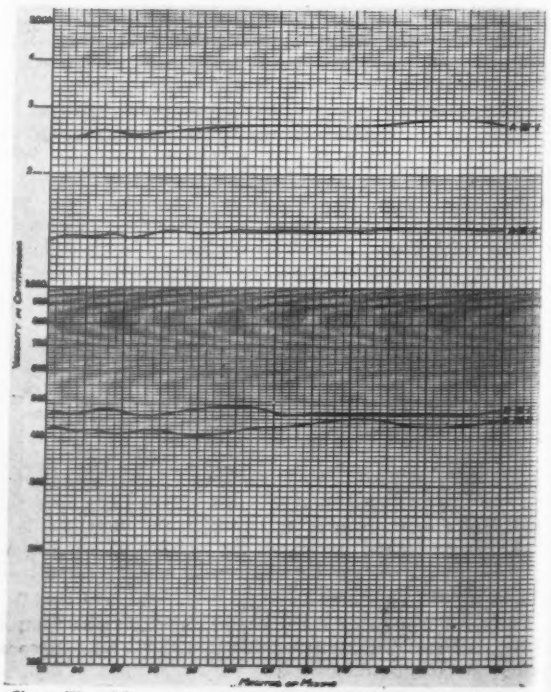

Chart III. Viscosity measurements of freshly mixed latex paints with anatase and rutile titanium dioxide using regular soybean lecithin with and without the pretreatment. Ordinate: Viscosity in centipoises; Abscissa: Min. of mixing.

After 1 week of storage at room temperature (24°C.) each paint was stirred for one hour, using an electric mixer; and it was then allowed to settle for 15 minutes. Then the viscosity was determined during one hour of continuous running of the spindle of the viscosimeter in the paint. The results of the paints of Group A are given in Table 5 in this article. The results of the paints of Group B are given in Table 6. The data are plotted in Charts IV and V.

TIME	VISCOSITY READINGS (centipoises)				
	A - O	A - I	A - II	A - III-1	A - III-2
Last viscosity measurement in Table 1.:	5200	2350	2000	2750	1440
0-60 min. mixing and 60-75 min.					
75 min	2900	2500	1650	2600	1600
80	3100	2450	1650	2600	1600
85	3050	2550	1650	2620	1600
90	3000	2550	1700	2600	1600
95	3050	2500	1700	2600	1600
100	2950	2520	1700	2600	1600
105	2900	2500	1700	2600	1600
110	2850	2500	1700	2600	1600
115	2750	2500	1750	2600	1600
120	2750	2500	1750	2600	1600
125	2750	2500	1750	2600	1600
130	2750	2500	1750	2600	1600
135	2750	2500	1700	2600	1600

Table 5. Viscosity determination of the paints of Group A after 1 week of storage at 24 deg. C and 1 hr. of electric mixing and a 15 minute settling period.

TIME	VISCOSITY READINGS (centipoises)				
	B - O	B - I	B - II	B - III-1	B - III-2
Last viscosity measurement in Table 2:	950	450	510	480	450
0-60 min. mixing and 60-75 min. settling.					
75 min	470	520	650	370	490
80	450	540	660	370	490
85	440	540	690	370	490
90	450	545	700	380	490
95	440	550	700	380	490
100	450	560	700	380	500
105	450	560	710	380	500
110	450	560	720	380	500
115	450	560	720	380	500
120	450	560	720	380	510
125	450	560	720	380	520
130	460	560	720	380	520
135	460	560	720	380	520

Table 6. Viscosity determinations of the paints of Group B after 1 week of storage at 24 deg. C and 1 hr. of electric mixing and a 15 minute settling period.

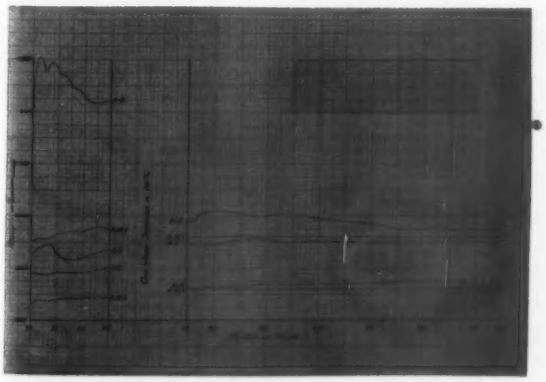

Chart IV. Viscosity measurements of Group A after one week storage at 25 degrees C. (Paints mixed one hour with electric mixer and allowed to settle 15 minutes).

Remarks

In comparing the paints without lecithin (paints A – O and B – O), and those with lecithin (paints A – I to A – III – 2 and B – I to B – III – 2), it is generally evident that the paints with lecithin retained their original viscosity to a greater degree than those without lecithin.

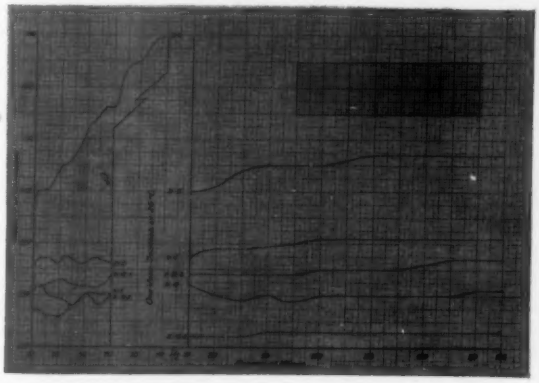

Chart V. Viscosity measurements of Group B after one week storage at 25 degrees C. (Paints mixed one hour with electric mixer and allowed to settle 15 minutes).

The reason for this is that the pigment in the paints with lecithin had been better dispersed before storage than those without lecithin. Then, after one week of storing, the paints without lecithin are more uniformly dispersed and as a result the viscosity becomes more of the same order as that of paints with lecithin.

The variations in viscosity of the paints with the same pigmentation but with different lecithin types is of minor order compared with the fact that various paints displayed similar uniformity under the test conditions.

It is to be observed that paint A – O, which contains no lecithin shows a decrease in viscosity during the one hour of viscosimeter spindle rotation, whereas paints with lecithin do not show this characteristic. To check on this behavior, another control test was made one week later. The paints were mixed by hand only, using a stirring rod, and the viscosity was measured.

Paint A – O again showed an increase viscosity of 3400 centipoises, paint A – I showed only 1900 centipoises, and A – II showed 1500 centipoises.

The test was repeated once more after a third week of storage. Again, paint A – O showed a viscosity of 2950 centipoises. In again taking continuous viscosimeter readings of this paint, the same decrease in viscosity was observed as is shown in Table 5. The results of this control test are given in Table 7. They indicate a more thixotropic condition of this paint, which was not evident in any of the paints shown in Table 5.

TIME	VISCOSITY READINGS (centipoises)
0 min.	2950
10 min.	2150
12 min.	2250
13 min.	2350
14 min.	2350
15 min.	2300
20 min.	2300
22 min.	2300
25 min.	2300
30 min.	2200

Table 7. Viscosity determinations of Paint A-O after 3 weeks of storage at 24 deg. C. Paints mixed by hand before making readings.

PART III—EFFECT OF LECITHIN

Experimental

The paint specimens selected for this study were as follows:

A – O – A 1% water dispersible lecithin I added, after 3 weeks storage, to titanium dioxide-latex paint, without previous lecithin.

A – I – A 1% water dispersible Lecithin I added, after 2 weeks storage, to titanium dioxide-latex paint, initially mixed with 1% water dispersible Lecithin I.

A – II – A 1% water dispersible Lecithin II added, after 1 week storage, to titanium dioxide-latex paint, initially mixed with 1% water dispersible Lecithin II.

In each case the paints were stirred and the viscosity determined before the additional 1% lecithin was added. After the addition, the mixture was stirred with the electric mixer for 10 min. and the viscosity was determined during a one hour period with the viscosimeter spindle rotating continuously in the paint. The test results are shown in Table 8.

Time	Viscosity in Centipoises 25°C.		
	Paint Specimen A – O – A	Paint Specimen A – I – A	Paint Specimen A – II – A
Before adding 1% lecithin.	2650	1900	1700
10 min. after adding lecithin with 5 min. settling.	2150	2900	1450
After:			
15 min.	2150	2900	1450
16	2200	2900	1550
17	2350	2850	1600
18	2400	2850	1600
19	2400	2850	1600
20	2400	2850	1650
21	2450	2850	1650
22	2500	2850	1650
23	2500	2850	1650
24	2500	2850	1650
25	2500	2850	1650
27	2500	2850	1650
30	2500	2850	1650
33	2500	2850	1650
36	2550	2850	1650
39	2550	2850	1650
42	2550	2850	1650
45	2550	2850	1650
55	2550	2800	1650
65	2550	2800	1650
70	2550	2800	1650
One week later.	2170	2300	1250

Note: After additional 1 hr. mixing and 15 min. settling, Paint Specimen A – I – A showed the following viscosimeter readings:

145 min. (70° 75°)	2200 centipoises	150 min.	2150 centipoises
146	2200	155	2200
147	2150	160	2200
148	2150	180	2250
149	2150	205	2250

Table 8. The effect on viscosity of addition of 1% lecithin to titanium dioxide latex paints after the paints have been stored for one, two or three weeks.

One week later, and subsequently at weekly intervals up to two weeks storage, viscosity determinations were made. The results are shown in Table 9 and in Chart VI.

Remarks

The results show a temporary thickening effect with the 1% addition of lecithin which was not of a permanent nature, although thickening effects were observed again upon longer storage. This was different from the pigment dispersing effect of the lecithin when added during its preparation where it aids in maintaining a stable viscosity.

Paint A – O – A showed a drop in viscosity, after the addition of 1% lecithin, from 2650 to 2150 centipoises. With continuous mixing for one hour, the viscosity increased to 2550 centipoises; but, upon standing for 1 week, it dropped to 2170 centipoises.

Paint A – I – A showed an immediate increase in viscosity with the addition of the supplementary 1% of lecithin, and it maintained this increased viscosity with continuous mixing

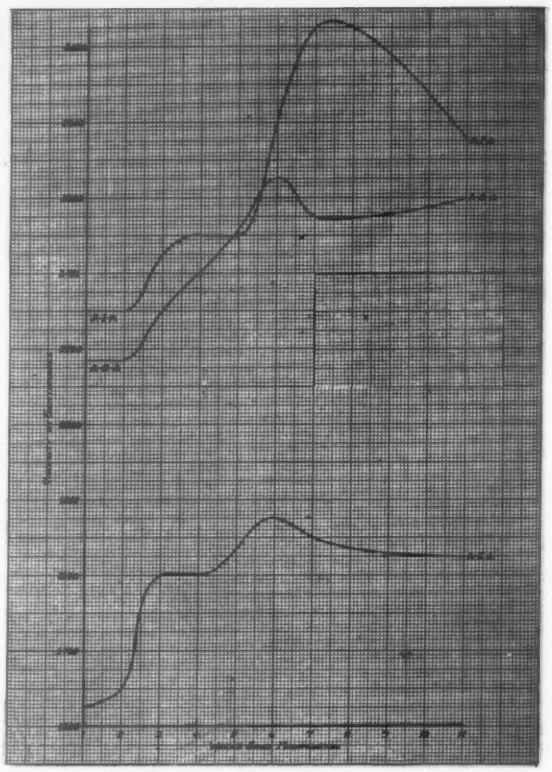

Chart VI. The effect of adding lecithin to completed paints during their storage time. Ordinate: Viscosity in centipoises; Abscissa: weeks since modification.

for one hour. Upon standing for one week, 60% of this increase had been lost and was not recovered in spite of 205 minutes of additional mixing.

Paint A – II – A showed a similar viscosity behavior as Paint A – O – A in that a temporary increase in viscosity occurred during mixing which was not maintained in storage.

In observing critically how these modified paints behave in further storage, and whether or not the addition of lecithin at a late state will influence their viscosities in storage, the results in Table 9 and Chart VI show that the three modified

Time of Storage. (after modification)	Viscosity in Centipoises 25°C. Paint Specimen A – O – A	Paint Specimen A – I – A	Paint Specimen A – II – A
1 wk.	2170	2300	1250
2	2170	2300	1300
3	2300	2450	1600
4	2400	2500	1600
5	——	2500	——
6	2650	——	1750
7	2550	3050	1700
8	——	3050	——
9	——	——	——
10	——	——	——
11	2600	2750	1650

Note: Each reading was made after the stored paint was mechanically mixed for 5 min. and allowed to settle for 5 min.

Table 9. Viscosity determinations on lecithin modified paints during eleven weeks of storage.

paints have an identical trend of increasing in viscosity after 6 or 7 weeks storage before reaching a certain stability. The paints which contained lecithin as part of their initial preparation do not show this type of behavior, as will be shown later.

In Parts I and II it has been shown that the addition of lecithin during the mixing of pigment and vehicle in latex paints caused the finished paint to reach a stable viscosity at a faster rate.

The present study was concerned with whether or not the same can be effected by adding lecithin to an already prepared paint. It was found that the results are less effective than adding lecithin during pigment dispersion, although certain thickening effects do occur.

PART IV—VISCOSITY CHANGES DURING 2 WEEKS OF STORAGE

This section is concerned with measurements of the viscosity prevailing in further storage of the seven initial paints from studies in Part I; that is, A – III – 1 and A – III – 2 and the group B – O, B – 1, B – II, B – III – 1 and B – III – 2, and the storage of the three modified paints of Part III, that is, A – O – A, A – I – A, A – II – A.

Experimental

At certain time intervals each paint was mixed mechanically and allowed to settle for 5 min. Then the viscosity was measured with the Brookfield Viscosimeter, Model LV. The results are given in Table 9 in Part III and in Table 10 in Part IV. They are plotted in Charts VI and VII. In each case the final viscosity reading of the preceding Table is compared with these new viscosity readings.

Time of Storage (weeks) — Viscosity in Centipoises 25°C.

Paint A-III-1	Paint A-III-2	Paint B-O	Paint B-I	Paint B-II	Paint B-III-1	Paint B-III-2
1	2600	1600	460	560	720	380	520
2	-	1800	450	590	860	-	-
3	2600	-	510	600	670	-	-
4	2700	-	480	-	-	-	390
5	2500	-	-	700	-	-	-
6	-	-	480	570	-	410	470
7	-	2050	450	-	980	-	-
8	-	-	-	-	-	470	-
9	-	1750	-	650	-	-	-
10	2400	-	490	-	-	-	-

Table 10. Viscosity determinations of seven compositions of Part I during ten weeks of storage.

Generally, all the test paints remained quite constant during the observation period. In the case of the B series, where B – O remained as a control specimen without lecithin throughout the whole period, its viscosity was found to be lower than the two specimens with water dispersible lecithins and were similar to that of the two regular lecithin type paints.

In the A series, the A – O sample had been modified into A – O – A during the work period when 1% water dispersible lecithin was added after 3 weeks storage.

Its viscosity before this modification compared with that of Paint A – O – A and A – I – A, 11 weeks after this modification, is given in Table 9 (in Part III). This is supplemented by Table 8 of this article, giving corresponding data for the latex paints A – III – 1 and A – III – 2 containing regular soybean lecithin instead of water-dispersible lecithin.

Summary

Generally the A series, or the series containing anatase titanium dioxide, show more pronounced developments in the viscosity conditions during storage than the B series containing rutile titanium dioxide.

In both A and B series, but especially in the A series, it has been observed that lecithin in water-dispersible form as well as the regular lecithin, decreases the formation of thixotropic conditions in the latex paints. This is shown in respect to Paint A – O in Table 5 and Table 7 (Part II) and in respect to B – O in Table 6 (Part II). In the same Tables the paints with lecithin showed very little of this phenomenon.

Table 9 and Table 10 show changes in viscosity during storage for 3 paints—the lecithin content of these paints was modified during the storage (Paints A – O – A, A – I – A, A – II – A), with 2 paints which were initially produced with 1% regular lecithin and not modified (Paints A – III – 1 and A – III – 2. The latter show a greater stability throughout the time of storage.

In this respect, an attempt was made to compare after 2 weeks undisturbed standing since the last viscosity test, the viscosity of the fluid 5 inches from the top of the settled paint with the result of a 5 minute mechanical mixing and 5 minute settling period without paying attention to any sedimentation not affected by this kind of remixing. The results are shown in Table II.

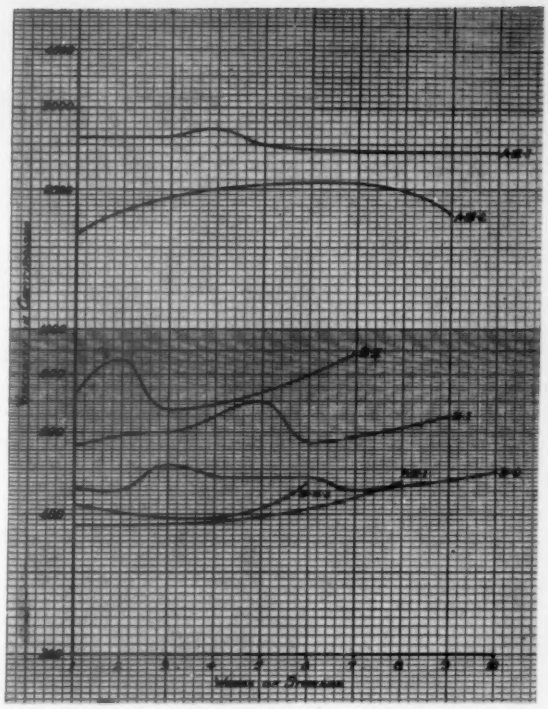

Chart VII. Viscosity measurements during storage of paints without modification. Ordinate: viscosity in centipoises; Abscissa: weeks of storage.

Paint Specimen	Viscosity before Mixing	Viscosity after 5 min. Mechanical Stirring and 5 min. Resettling.
A-O-A	1700	2100
A-I-A	-	-
A-II-A	1700	1950
A-III-1	1500	1700
A-III-2	1800	1750
B-O	550	400
B-I	800	716
B-II	800	980
B-III-1	440	470
B-III-2	520	470
A-O (Centrolene lecithin)	1900	1650

Note: For paint composition see Part I of this series.

Table 11. Results of settling test: viscosity determinations on test paints made 3 inches below surface before mixing or stirring paints after 2 weeks settling period. (Made 2 weeks after storage series).

Finally, the pH was checked in all paints after the end of this series, as shown in Table 12, and compared with the

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DEVELOPMENTS IN EXTENDER PIGMENTS

A PANEL DISCUSSION

"DEVELOPMENTS in Extender Pigments" was the subject of a panel discussion presented March 24, 1954 at the New York University Surface Technology forum in cooperation with the New York Paint and Varnish Production Club and the New York Paint Varnish and Lacquer Association. Professor Myron A. Coler of the N.Y.U. staff acted as chairman of the panel. Four well known figures from the paint industry made up the panel: *Henry F. Payne of the American Cyanamid Company, Dr. Ray L. Mc Cleary of the Thompson-Weinman Company, and Milo Stearns of the R.T. Vanderbilt Company and W. Robert Price Jr. of the Georgia Kaolin Company.*

Panel members at recent NYU discussion. L to r—Milo Stearns, W. R. Price, H. F. Payne, Myron Coler and Dr. Ray McCleary.

Henry F. Payne is a graduate of Pratt Institute and the Polytechnic Institute of Brooklyn. Since 1945 he has been adjunct professor in charge of the courses on Organic Coating Technology at Brooklyn Polytechnic. Mr. Payne's experience in the paint industry includes 15 years engaged in manufacturing paint, varnish and lacquer in New Jersey. In 1937 he was placed in charge of the resin evaluation laboratory of the American Cyanamid Company in Stamford. For the past seven years he has been in Cyanamid's New York Office in sales promotion and technical writing and is the editor of Cyanamid's well-known publication *"For Instance."*

General Characteristics

Henry Payne headed off the discussion with a general outline of the characteristics of extender pigments. The effect of factors such as particle size and shape, surface characteristics and lack of opacifying action were illustrated and discussed. Since the refractive index of extender pigments and that of the oils and resins in which they are dispersed all lie in the same 1.48 to 1.65 range, there is practically no internal scattering and diffusion of light. This accounts for their transparency. Visible light falling on a paint film is partly reflected and partly transmitted. The transmitted part in turn is reflected from the sub surface. When all the constituents of the paint film have a similar index of refraction the sub surface is visible. Use of this phenomena is made in the manufacture of transparent flat and semi-gloss finishes. Paint films containing pigments with an index of refraction higher than that of oils and resins are opague. Mr. Payne demonstrated how transmitted light is deflected and reflected in passing from vehicle to pigment particle and back to vehicle again that a diffused light effect is created. The greater the difference between the index of refraction of the vehicle and that of the pigment, the greater is the amount of scattering and diffusion of the transmitted light with little or no light being reflected from the sub surface. With high hiding pigments, the paint film is visible only by the light reflected from the top surface.

Mr. Payne then discussed the wide range of particle sizes available in extender pigments. They range from the larger 25 micron size used principally for flatting effect to the 2-5 micron range and in some cases down to .03 microns. In addition to the particle size, another factor of importance is the particle shape. Extender pigments generally fall into the nodular, and indeterminate block or lump shape, the acicular, a needle shaped particle of the lamellar, a plate form. The acicular and lamellar are the only two shapes that might be considered to have a tendency to reinforce a paint film. It is also possible to control the consistency of paints by the proper choice of size and shape of a particular extender pigment.

Calcium Carbonate and Mica

The next panel member, Dr. Ray L. Mc Cleary presented the Developments in Calcium Carbonate and Mica Extender Pigments." Dr. Mc Cleary is the Technical Director of Thompson-Weinman Company, Inc. whose research laboratory is located in Montclair, New Jersey. Previously with the E.I. Du Pont de Nemours Company, Dr. Mc Cleary has had a wide and varied experience in the study of all types of white pigment materials used in the paint industry. Dr. Mc Cleary is a native of Ohio. He graduated from the Liberal Arts College of Ohio Northern University in 1929 and re-

ceived his M.S. and Doctor of Philosophy degrees from Ohio State.

According to Dr. Mc Cleary, since the introduction of high hiding power white pigments and high tinting strength colors, that class of materials known as extender pigments has taken on greater significance. In fact, those extender pigments which are designed to give certain specific performance are continuing to increase in importance because of increasingly higher percentages of the high hiding power pigments being produced. The manufacturer of extender pigments must also be able to produce sufficient quantities of the many types required and control the characteristics of each type within very narrow limits.

In developing the principal factors of merit of finely ground calcium carbonate, Dr. Mc Cleary pointed out that these pigments have very strongly oil-o-philic properties which account for its extreme "ease of wetting characteristics" in oils, varnishes and alkyds. Also, its very low absorption properties due to the "perfection of distribution in particle size" along with its "oil-o-philic" character and its very low reactivity characteristics in spite of its oil-o-philic character. Final and most important consideration from the paint makers point of view is its low cost. Continuing, Dr. Mc Cleary, illustrated how these characteristics of calcium carbonate extender pigments can be applied to advantage in making different kinds of paint finishes and in some products related to the paint industry, such as putty, glazing and chaulking compounds.

In discussing the formulation of washable flat paints it was pointed out that the proper choice of the extender pigment is very important. For best results, the extender pigment or combination of extender pigments would display strongly oil-o-philic properties and low binder requirements and have as near a perfect distribution of particle size as possible in order to give absolutely minimum voids to be filled with vehicle solids. Also, the extender pigments should be used in as high a pigment volume concentration as possible. In this way flat paints can be produced which have high solids content per gallon and low raw material costs and yet display excellent non-penetration and stain removal properties.

As a result of seven years intensive study, results have indicated that the ground calcium carbonate pigments can be successfully used in the manufacture of high quality exterior house paints. It has long been known that the durability characteristics of all of the ground calcium carbonate pigments are very acceptable in tints and also in self cleaning whites except in their tendency to yield a cracking type of failure in the latter. However, this tendency can be minimized even in whites, if the low absorption grades of calcium carbonate are used. Future work revolves around a continued study of all grades of ground calcium carbonate with and without high brightness mica, with and without organic mildew control agents, in formulas which contain a minimum or even no leaded zinc oxide or acicular zinc oxide. According to Dr. Mc Cleary, several years of development work in the field of latex paints based on butadiene-styrene and more recently upon acrylic latex has shown that the strong prejudices against the use of calcium carbonate in this type of paint is not justified. Several formulas were offered as illustrations. A similar situation exists in regard to the quick setting polyvinyl acetate latex primers.

Dr. Mc Cleary also covered the work accomplished in the field of putty, glazing and chaulking compounds and a brief survey of the use of mica in conjunction with the calcium carbonate pigments.

Magnesium Silicate

The "Developments in Magnesium Silicate" pigments was presented by Milo E. Stearns. Mr. Stearns is a graduate of Pratt Institute of Brooklyn. Since his graduation he has been with the R. T. Vanderbilt Company at East Norwalk, Conn. At present he is head of the research and development work on pigments, extenders and specialties in the paint laboratory. He is an active member of the American Society for Testing Materials.

Magnesium silicate occurs in several workable deposits in our country. They consist of mixed minerals, essentially hydrous magnesium silicate, of many particle shapes: amorphous chunks, plates, fibres. The ground products are available in three broad classes of talc: coarse, smooth, superfine. Talcs are inert chemically but contribute many desirable physical properties to paint systems such as: soft consistency that aids suspension and brushing: "tooth" for primers and undercoaters: dullness for flats. In their largest use—outside house paints—they reinforce the film due to the multiplicity of particle sizes and shapes yet, because of chemical inertness, do not cause cracking or checking. They are not stained by industrial gases or metals and allow sufficient chalking to remove unsightly dirt collection. Coarse grades cause mill abrasion and discoloration. Smooth grades developed during the last few years require a minimum of paint milling to make fine-textured paints of good film smoothness. Mill wear is reduced; paint output increased. The smooth grades are becoming most popular for house paints and specification paints. Another rather recent development—superfine talc—is finding wide acceptance for such properties as consistency adjustment, pigment suspension, dulling, and control of sagging, floating, and flooding. This very fine talc requires little paint milling and is often simply stirred in to the paint with no sacrifice in established film smoothness.

W. Robert Price Jr. of the Georgia Kaolin Company presented his talk on "Factors Governing the use of Kaolin Clays as Extender Pigments in Paint Systems". Mr. Price is a graduate of the Case Institute of Technology. He received intensive training with the St. Regis Paper Company and the International Paper Company in the techniques and problems involved in coating paper. For the last four years he has been employed by the Georgia Kaolin Company of Elizabeth, New Jersey where he has been engaged mainly in research, development and sales work in the paper, paint and plastics fields.

Mr. Price stated that due to its chemical composition and the way that the various components of kaolin, a hydrated aluminum silicate, are tied up in the crystal, that kaolin is chemically non-reactive in paint systems. The little or no valence charge carried by the kaolin crystal is predominately negative in nature, and is anionic in the pH ranges in which the paint formulator is interested. Since most aqueous systems are anionicly stabilized, clay will be compatible with and have a high degree of stability in these systems.

It was stressed that the thin, flat, hexagonal plates characteristic of kaolinite do not exist in sizes larger that about 2 microns. Above this size they exist as stacks of plates which are tightly cemented together by natural forces. Due to this change in particle shape, i.e., this change in kind at about 2 microns, the plate-like particles will tend to give results which deviate strongly from those obtained using the coarser particles.

Most commercial grades of kaolin contain a certain amount of both fine and coarse particles. It is the ratio of the fines to coarse, or, more precisely, the plates to the stacks, which gives the individual commercial grades their own set of properties. Because of the wide range in properties exhibited in going from the stacks to the plates, the paint formulator has to exercise care to be sure he has the correct particle

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HIGH POLYMER CHEMISTRY IN PROTECTIVE COATINGS

By E. G. SHUR
Finishes Division
Interchemical Corp.

THE formulation of vehicles for the paint industry is no longer dependent upon the jealously kept and secret art of the master varnish maker. What was varnish manufacture in the early part of this century is now the rapidly developing science of organic resin synthesis.

Now in retrospect, it may readily be seen that the properties of matter which have always been of use in our industry have been those of *giant molecules*: in oils, cellulose, starch, rubber, etc.

Mechanism of Polymerization

There are two fundamental polymerization mechanisms by which such macromolecular polymers may be formed: addition polymerization and condensation polymerization. Addition polymers are formed by a recurrent interaction of unsaturated monomers containing a double bond e.g. polyvinyl chloride. The polymer is atomically *identical* with the monomer. Condensation polymers form by the reaction of monomers with an attendant *splitting out* of a simple molecule such as water, hydrogen chloride, etc. In these reactions the polymer is *not* identical with the monomer.

The ability to form primary valence bonds is defined as *functionality*. We may use an esterification reaction for illustrative purposes. *Mono-monofunctional systems* may be formed by a reaction between a monocarboxylic acid and a monohydric alcohol resulting in a monomeric simple ester. *Mono-trifunctional systems* may be exemplified by the reaction between a monocarboxylic acid and a trihydric alcohol which results in a monomeric triester. It is obvious that if the two reactions contain only one kind of functional group and if either reactant is mono-functional, polymerization does *not* occur. Polyfunctional systems are composed of reactions with two or more reactant groupings per molecule. These may polymerize to form linear and space polymers depending upon the number and type of functionality present. The polymerization of two or more units, each of which is capable of undergoing polymerization, into the same chains, is called copolymerization.

Synthesis and Properties

Whereas synthetic polymers may be made first by synthesis of the appropriate monomers and then by polymerization in the proper combination and amounts, natural polymers frequently require chemical modification to render them suitable for practical use, e.g. rubber reacted with sulfur, is vulcanized to hard rubber: cellulose is esterfied with nitric acid to cellulose nitrate (pyroxalin). The structure of these natural materials and of their synthetic analogs has been revealed by various physico-chemical methods such as X-ray diffraction analysis, viscosity measurement, osmotic pressure, and the ultra-centrifuge. Their important properties, such as impermeability, insolubility, adhesion, flexibility, elasticity and plasticity all are a function of this macromolecular structure. The unique properties of high polymers are attributable directly and solely to the unusual shape and size of the molecules.

When high polymers are synthesized, there is a considerable spread in the sizes and molecular weights. A high polymer does not really have a molecular weight, it has an *average* molecular weight, and an *average* size, freezing point, viscosity, etc. Most organic compounds including those used in making high polymers have an intermediate range of melting and boiling points indicating intermolecular attraction of intermediate magnitudes. In an homologous series of compounds, such properties as boiling and melting points, tensile strength, etc., which may be ascribed to the magnitude of intermolecular attraction, increase with increased molecular weight.

The molecules of any species of high polymer, at varying degrees of polymerization, are also members of an homologous series. Properties that vary with the degrees of polymerization are softening point, solution viscosity, tensile strength, elastic modulus and solubility. Those essentially independent of change in degree of polymerization, are refractive index, hardness, electrical properties, color, and density. Copolymerization of 2 monomers, each capable of linear polymerization, results in a lowering of the softening point and an increase in solubility.

Polar grouping occurring along

the molecule of a high polymer exert strong attractive forces on molecules around them. All other things being equal, this attraction is reflected in higher tensile strengths, melting points and crystallizing tendencies. A symmetrical structure i.e. without branches or side chains, permits closer molecular packing and greater total intermolecular attraction.

Crystallinity in a high polymer is characterized by an ordered arrangement and regular recurrence of atomic or molecular structures and is generally detected by X-ray diffraction analysis. Linear high polymers are difficult to align because of their length, yet order is attainable by passing the polymer through dies under pressure and tension. The fibers, "oriented" in this way, exhibit greater crystallinity of structure as revealed by X-ray analysis, as well as greatly increased tensile strength.

Rubber "stretch" corresponds to an extension of the ends of long coiled molecules under tension, which retracts relatively rapidly to its original shape upon release. The results of stress-induced orientation are sharper X-ray patterns, decreased solubility, increased softening point, greater density and higher luster. Such fibers will remain under tension only if the new arrangement is one of lower free energy. With rubber this is not true, the molecules are long chained, very flexible and the intermolecular attraction low, hence its high order of reversible extensibility characteristic of *elastomers*. If the chains are rigid, the intermolecular forces intense and the symmetrical structure such that a lattice may form, the crystallinity will remain permanent. Such a material would be a typical *fiber*. Materials intermediate in properties are called *plastics*.

It should be remembered that these properties are those of linear molecules. Cross linking through three dimensional space tends to set the mass into rigid super-molecules of infinite molecular weight. The physical properties of space polymers depend upon the nature of the main chains, the cross-links, and the number of cross links. Space polymers are insoluble, infusible and non-moldable.

Solubility and Viscosity

Some qualitative rules for solubility may be expressed as follows, Chemical and structural similarity favor solubility—"like dissolves like". Similar polarity favors solubility. The higher the melting point of the resin, the lower its solubility. Solubility increases with increase in temperature. Solubility decreases with increased molecular weight. The solvent action of atomic groupings of different polarities is specific. These contribute solvent action independently.

A solvent mixture is chosen where generally high volatility or selective evaporation of a particular solvent is desired. A need for low volatility or the necessity for maintenance of a constant solvent composition, calls for a multi-structural single solvent. A mixture of solvents is frequently better than either alone for two reasons.

1. Each may solvate a different group on the polymer chain; and
2. The polar group on one solvent will solvate the polar group on the polymer. The solvated polymer chain will then be less polar since the non-polar parts of the solvent molecules will be directed outward and the addition of a less polar solvent may then enhance solubility.

A rigid structure with symmetrically aligned points of intermolecular attraction will resist solution. Partial conversion of cellulose to the cellulose ether *increases* the solubility in polar solvents by pushing the cellulose chains further apart, despite the over all *decrease* in polarity.

Summarizing the relations between viscosity and solubility briefly, we find that the rate of increase of viscosity with concentration is greater in a poor solvent than in a good one. However, the intrinsic viscosity is higher in a good solvent than in a poor one at low concentrations where the solute molecules are not solvated and are on the point of precipitation. This means that curves of the viscosity of a polymer in a good vs. a poor solvent, will cross at relatively low concentrations.

Oxidation and Condensation

Oils dry by oxidation, probably by peroxide formation at the double bonds followed by polymerization to the solid state involving formation of the *tri*-glyceride. The presence of non-drying saturated fatty acids probably yields films of better flexibility by reducing the rigidity of structure. The bodying of oils under inert atmospheres results from linkage of the unsaturated fatty acid chains through the mechanism of the Diels-Alder 1.4 addition reaction. Blowing of oils accomplishes both oxidation and polymerization. Treated oils yield films with better properties since carbon to oxygen linkages are replaced with carbon to carbon linkages.

In order to bet a tri-dimensional network, in alkyd resins, it is necessary to react a dibasic acid with a tri-functional alcohol. With monoalcohols we get diesters, with di-alcohols we get linear polymers, with tri-alcohols we get three dimensional polymers. Pure phthalic glycerol alkyds are insoluble, the tri-dimensional network being too tight. If we replace part of the phthalic by a long chain monobasic acid (as in oils,) oil solubility is promoted and the unsaturation in the fatty acid improves the drying properties.

Phenol formaldehyde resins react by polycondensation, forming phenol-alcohols which then intercondense, eliminating water. With phenol, 3 reactive positions, ortho, meta, and para are available. If one is blocked off as in ortho or para-cresol, only linear macromolecules may be formed. The use of cresol gives resins with better flexibility, solubility and slower hardening than those made from straight phenol. Other alkyl substitutions may be made, eg. paraphenyl phenol and similar results may also be obtained by reacting with rosin at the ortho-phenol alcoholic group. Phenolic resins may be modified with conjugated drying oils to form tough, durable and resistant varnishes.

(Turn to page 73)

COLOR MATCHING IN MASS PRODUCTION

WHAT COLOR is your car? Do the fender, hood and body match? If they didn't you probably wouldn't have bought it. Your automobile was produced through thousands of operations; parts from all over the country were brought to the huge plant and sent through streams and tributaries of assembly lines to the big river where the complete car began to take shape. Many of the parts had to be timed so accurately to reach the right place at the right moment that a central teletype system controlled the start of various parts on their trip down stream. Not only must the green metallic fenders reach the green metallic body at the proper time, but these parts must match exactly as if painted in one operation with the same batch of paint. Otherwise hundreds of man hours of work and planning are lost.

The color problem was heightened when the automotive and other mass production industries turned to delicate pastels, tricky polychromatic finishes and the multitude of shades known as appliance whites. Because the assembled pieces have to blend as if painted in one operation the standards of color matching became so exacting that new methods of assuring perfectly matched colors had to be found.

To continue with our example of the automobile: the body painted in one part of the huge plant swings on the overhead monorail to a point known as the "body drop" where it joins the chassis.

Test panel sprayer in operation

Another thirty or forty feet down the line the front-end assembly including the fenders is mounted. Still further on the hood is set in place. Each part painted in a different section of the plant, or even in plants at different locations, must match when assembled.

Achieving a Perfect Match

To insure perfect matching, a system of color tolerances is employed based on the National Bureau of Standards NBS color unit. This unit is defined as 3-4 times the minimum color difference perceptible to the trained observer under the best conditions of observation. *E. I. Du Pont de Nemours & Co.* holds its automotive and industrial color tolerances to a range of 0.3 to 0.4 NBS color units. A color half a unit from the standard supplied by the manufacturer is rejected.

With such close tolerances, it is evident that a very accurate method of reproducing color samples must be employed.

The old method of color matching and color testing by hand spraying was inadequate for the new colors and finishes. Human variations in speed of traverse, distance from and angle to the test panel produced dissimilar results even with the *same* batch of *paint*. You can imagine the "rhubarb" that could (and did) arise from this situation. In fact, not only different operators, but the same operator produced differing tests.

This dilemma led to the development of a test panel sprayer which would be practical and still eliminate all human error in the application of finishes for matching and testing.

The first successful test panel sprayer to be marketed has been claimed by the *Eclipse Air Brush Co.* The first of these machines was purchased by E. I. Du Pont de Nemours & Co. They now have over forty units in operation at seven plants throughout the United States. Other machines have been purchased by paint manufacturers and end users including several of the large automotive companies.

The original test panel sprayer consisted of a stainless steel box 12″ high, 15″ wide and 28-¼″

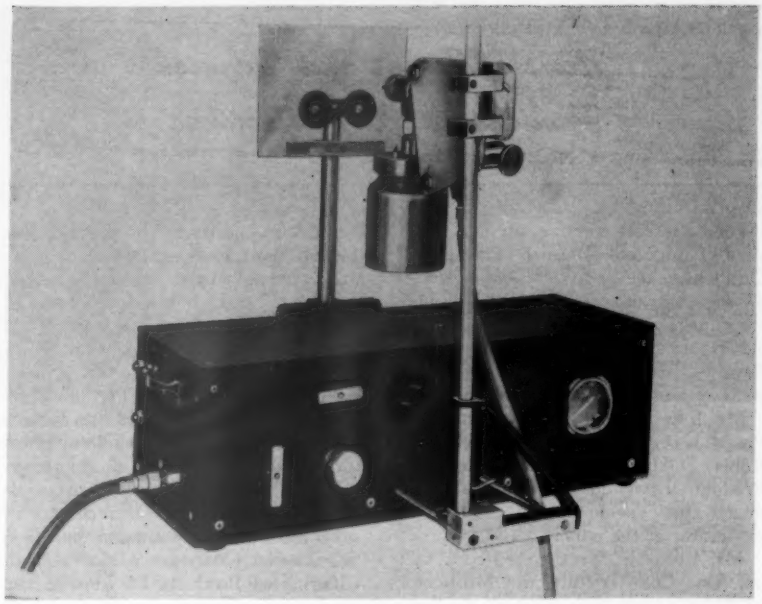
long with an arm to hold the test panel and carry it past a spray gun at a specific speed. The gun was held stationary by a holder which could be set for distance, angle and height. The gun of any manufacturer could be used.

The new and improved Eclipse Test Panel Unit, now available, (1) runs by compressed air, making it explosion proof, (2) is lighter and can easily be carried by one operator, (3) runs at variable speeds which can be read directly in inches/minute from a dial at the front. These are in addition to the original features. The eddy current speed control produces uniform panel traverse in spite of normal air line pressure variations.

Since paint is not produced in a continuous run, each order must be tested and matched to the customer-accepted standard for color and other characteristics. The "OK" to run the batch is then given. After the batch is completed a wet and/or dry (panel) sample may be sent to the customer for his acceptance before shipment. Throughout the process test panel sprayers are used.

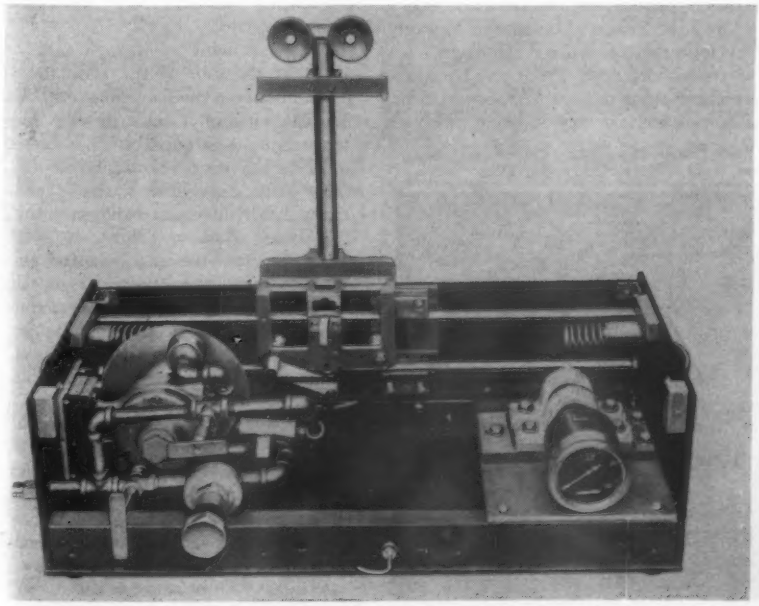
Today the operator—whether a production color shader or quality control technician—can quickly fit a panel of any size (3″ x 5″ to 12″ x 14″) or material against the venturi operated suction cups. Then set the speed as designated in the specifications (anywhere from 300 to 2500 inches a minute) and the distance from the gun to the panel (from 6″ to 18″). After the gun is adjusted vertically (anywhere 6″ above or below center line of the panel) the operator can produce a test panel to specification.

Once the specifications are followed, the end result is always the same. The coatings are of uniform thickness; the colors can be duplicated in test panels whether in South Bend, Detroit, Philadelphia, or San Francisco.



Test panel sprayer unit ready for use.

Interior view showing construction of test panel sprayer.



Practical Results

The Test Panel Sprayer has made possible the development and classification of thousands of polychromatic colors. They are employed in the finishing of vacuum cleaners, water coolers, air conditioning units, lamps, filing cabinets and automobiles. At the present time the automotive industry probably accounts for better than ninety per cent of the polychromatic finishes—consisting of the slow-drying synthetic resin finishes and the fast-drying nitrocellulose lacquers. One large automotive plant now produces seventy-seven different colors on its cars—colors quickly and accurately reproduced by the Test Panel Sprayer.

New pastel shades and approximately one hundred variations in appliance whites are more accurately matched on the doors and bodies of refrigerators, colored and white kitchen cabinets, stoves, deep freezers and washing machines and dryers. These are usually sprayed at different times with different batches of material.

(Turn to page 75)

News of Paint and Varnish Production Club Meetings

New York

The monthly meeting of The New York Paint and Varnish Production Club was held April 1st with more than 300 members and guests attending. The program for the evening featured a panel discussion on "Quick Drying Finishes" by members of the technical staff of the Hercules Powder Company.

Mr. John Congleton, chairman of the Program Committee, introduced Mr. Robert D. Ullrich, of Hercules' Cellulose Products Division, who in turn introduced the speakers and served as moderator of the panel.

Mr. Rufus F. Wint presented a talk on "One Coat Texture and Multicolor Finishes" which indicates that one long time goal of the coatings formulation, namely a one coat polkadot finish, can now be realized. These novel finishes are two phase systems, similar to an emulsion, but since the dispersed phase can vary in particle size from 50 to 2500 microns, the resulting finish is more accurately described as a suspension. These so called lacquer suspensions may consist of a single lacquer of a selected color (containing normal lacquer components such as nitrocellulose, resinous modifiers, plasticizers, solvents, diluents, etc.) or two or more lacquers each with a different color, all dispersed in the water phase. The water phase should contain a protective colloid or emulsifying agent, or both, to form an oriented layer around each droplet of the dispersed phase, making the droplets repel each other. These finishes are relatively simple to prepare, if the lacquer phase is available. A multicolor finish was produced during the talk to emphasize the simplicity of the operation. The advantages of these novel finishes are: 1) Provide in a single application, multicolor finishes in which the different colors remain distinguishable to the naked eye. 2) Can be applied to porous and non-porous surfaces. 3) Allows application of heavy coatings in a single treatment. 4) Can be applied to dissimilar materials without leaving them show. 5) Permits application to damp as well as dry surfaces when water is the continuous phase.

A critical evaluation of chlorinated rubber's place in organic finishes designed for chemical resistance was the substance of the discussion by F. K. Shankweiler, Manager of Sales of the Chlorinated Products Division of Hercules. Mr. Shankweiler analyzed the economics involved in the use of Parlon, its moisture resistance, alkali and chemical resistance, ease of application, adhesion and flexibility, as compared to other chemical resistant coatings. He concluded that Parlon's overall rating in these categories indicate that it should be seriously considered by the chemist formulating to these ends.

Mr. G. N. Bruxelles discussed the properties of a new nitrocellulose based zinc chromate primer MIL-P-7962. The increasing usage of steel and aluminum require greater quantities of fast drying, cheap coatings and this new specification primer is a further step in that direction. The improvements demonstrated by this formula over the formula it replaces are faster dry, better stability, and better intercoat adhesion between primer and succeeding coats.

Mr. J. R. Yeager, Manager of Market Development, Coatings Division, of Hercules' Cellulose Products Division presented some data on the formulation of improved fast drying floor finishes.

Speakers at the April meeting of New York Production Club. L to R— F. K. Shankweiler, J. R. Yeager, R. F. Wint, R. D. Ullrich, G. N. Bruxelles.

His evidence indicates that finishes based on blends of shellac and nitrocellulose have shown advantages over straight shellac finishes. Specifically, a formula composed of 70 parts solids and 30 parts of SS¼ second N. C. showed improved performance in abrasion resistance, water resistance and speed of dry. Mr. Yeager also discussed and illustrated the effects that can be expected by incorporating newly available ultraviolet absorbers in lacquers. These lacquer additives, one of which shows particular merit, act to filter out wavelengths in the 200-400 millimicron range, which normally tend to discolor lacquer finishes over certain woods. The unique aspects of these absorbers a.e solubility and permanence.

Mr. Ullrich presented data on a relatively new film former, ethyl hydroxyethyl cellulose, EHEC, a mixed ether of cellulose with mechanical and compatibility properties similar to ethyl cellulose. The unique property of tnis material is its solubility in solvents with a K. B. of 35 or higher. As little as 8% ethyl, isopropyl, or butyl alcohol insures the solubility of EHEC in as poor a solvent as hexane. EHEC is generally compatible with all the conventional hard resins and plasticizers. Potential uses of this product are in silk screen printing inks, heat set inks and special coating problems such as lacquers to go over metallized plastics. Another field of use is as a cold cut modifier for varnishes where it is desirable to control viscosity and penetration, to speed dry, or to upgrade toughness and alkali resistance. Small percentages of EHEC act as anti-float agents in some aromatic based automative enamels, and it can be used in aliphatic enamels if it is first dispersed in xylene. EHEC is probably not truly compatible in these enamels even when present in very low percentages, however.

At the conclusion of each talk, and again at the end of the program, the panel answered questions from the floor. The showing of a color movie "Flight to Lacquer" rounded out the evening.

The Technical Committee of the New York Paint and Varnish Production Club neld its monthly meeting a the Brass Rail on Thursday, March 18th. Forty-Nine members and guests were present.

Two new guests were introduced namely, Chester J. Malec of Benjamin Moore & Co., and Isidor Wetchler of Camel Lead Color and Chemical Products Mfg. Co.

Fred Damitz advised the committee via letter that the Dry Hiding Power Method developed by the New York Club has been accepted as a Federation standard.

Two of the active members of the committee were congratulated for the

(*Turn to page 69*)

Summer Paint Courses at North Dakota Announced

Dr. Wouter Bosch, chairman of the Department of Paints, Varnishes and Lacquers at North Dakota Agricultural College, Fargo, North Dakota, informs us that two Special Paint Short Courses will be offered again this summer.

The "Seventh Paint Short Course for Beginners" is scheduled for June 21-July 2, 1954 and the dates for the "Fourth Advanced Paint Refresher Course" are July 12-23, 1954.

As has been customary the Beginner's Course will be taught by Dr. Bosch with the help of graduate assistants. In the Advanced Course, eighteen well-known industrial experts will participate as guest lecturers.

Copies of the bochure will be sent about May 1st to all members of the National Paint, Varnish and Lacquer Association as listed in the 1953 Yearbook, all N.D.A.C. paint alumni, all alumni of previous paint short courses and to everyone who has indicated his desire to obtain information.

The enrollment in the Beginner's Course is limited to twenty five students and a maximum of fifty men can be accomodated in the Advanced Class. Since the interest in this year's short courses is greater than it has ever been Dr. Bosch cannot accept pre-registrations, but urgently advises to return the application blanks that will be enclosed in the brochure as quickly as possible. Registrations will be accepted on a "first come, first served" basis.

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Witco Chemical Opening Plant on Pacific Coast

First Pacific Coast plant of Witco Chemical Co., is being opened during March in the Lynwood section of Los Angeles, Calif. Initial production will seek to meet the growing Western demand for Witco paint driers, but operations are planned eventually to include the manufacture of various organic chemicals.

The plant comprises four modern factory buildings on three fenced acres, with open and covered storage facilities, and railroad siding.

Chief Engineer H. P. Hartman has been supervising the installation of equipment. Production will be in charge of Arnold Hoffman, formerly of Witco's Chicago plant.

The production of this plant will be marketed through Witco's sales offices in Los Angeles and San Francisco.

Five condemned culprits (seated l to r), Louis Sloan, E. Dale Albert, S. Leonard Davidson, Carl Engelhardt and G. M. Babcock, awaiting "hanging" at a recent trial of Gallows Birds.

N. Y. Section of Gallow Birds Hangs Five Technicians

A meeting of the New York Section of the Gallows Birds Society was held at the Chemist Club, 50-41st Street, New York City, recently.

The section was honored in having present National High Gallows Sam Gutkin, Past National High Gallows Bird Jack Broeker and two charter members of the society Austin Allen and Hal Aldrich.

Members of this society can only be obtained from that group of individuals who have worked on Government Specifications and have stuck their neck out so far that they have made mistakes of such a nature that they should be hung.

At this meeting five paint and varnish technicians were hung. E. Dale Albert on Specification 52 M C 18, G. M. Babcock on Specification MIL-L-8641, S. Leonard Davidson on Specification TTP—31B, Carl Engelhardt on Specification MIL-V 173A, Louis Sloan on Specification 52 P 42.

Alber was prosecuted by Austin Allen and defended by Ralph Everett.

Babcock was prosecuted by Eric Zimmerman and defended by Jack Lurie.

Davidson was prosecuted by Herb Hillman and defended by Art Minich.

Engelhardt was prosecuted by Tony Santoro and defended by Sam Gutkin.

Sloan was prosecuted by Fred Byerly and defended by Frank Munns.

During the trials and the elaborated preparations and speeches by the Prosecutors, the court room was filled with continuous roars of "HANG HIM." The defense attorneys were permitted to say little, which amounted to exactly nothing, and Judge Broeker made sure the trials proceeded swiftly and unfairly. Each Culprit was found guilty as charged and Hung by the neck.

The Gallows Birds in the past have had an annual meeting generally during the annual convention of the Federation of Paint & Varnish Production Clubs. Through the efforts of National High Gallows Bird, Sam Gutkin, sectional groups of Gallows Birds have been organized which will meet two to three times a year. There are now a Washington Section, a Southern Section, a New York Section with others to follow.

The officers of the New York Section for 1954 are: Chief Gallows Birds—Fred Damitz, Keeper of the Keys—Stanley Richardson, Attorney General—William Gardner, Chief Hangman—Albert Hoddinott.

G-E Establishes Development Unit for Silicone Products

The establishment of a new advance and development unit within the Engineering Section of the General Electric Company's Silicone Products Department was announced by Dr. Edward A. Kern, manager—engineering for the department.

Dr. Robert O. Sauer was named manager of this unit, with the title of manager—advance and development engineering.

Dr. Sauer joined General Electric in 1950 as a research associate at the Research Laboratory in Schenectady.

Haeuser Shellac Represents Medusa Masonary Paints

Robert L. Henry, Manager of Medusa Masonry Paints, Division of the Medusa Portland Cement Co., recently announced the appointment of the Haeuser Shellac Co., Inc., of Brooklyn, N. Y., to represent Medusa Masonry Paints, as exclusive sales agent for the greater New York Metropolitan area.

John D. Baruc, Vice-President In Charge of Sales, for the Haeuser Shellac Co., Inc., will be in direct charge of the promotion of the Medusa Paint Products, through the Haeuser sales staff which presently services paint dealers in the New York area.

Second West Coast Symposium Held in San Francisco, Calif.

The Second Pacific Coast Production Club Symposium, held March 25-27th in San Francisco, attracted some 700 executives and technologists.

The host club of this symposium was the Golden Gate Paint and Varnish Production Club. Its president, Richard P. Weber, introduced officers of the Los Angeles and Pacific Northwest Paint and Varnish Production Clubs, the Golden Gate Paint, Varnish and Lacquer Association, and officers of the Federation of Paint and Varnish Production Clubs.

Several technical papers were presented together with a panel discussion on, "How Do Technical Departments Consolidate with Production and Sales?"

Moderator for this panel discussion was Frank Wilson of the City College of San Francisco. He said,

"Technical progress has resulted in a multiplicity of coatings for widely diversified fields, producing beauty and functional services far surpassing those of the past. Customer demands, however, are never satisfied and old lines must be continually improved and new products devised to meet changing conditions. While the technical man can literally produce what formerly was impossible, he still needs close coordination with production and sales to adapt properly his skill and knowledge to the desired end.

"Technical personnel is dependent on the raw material group for much of the basic research, since the complexity of our raw materials today make it impossible for the technician to do it all himself.

"Close cooperation is needed between the technical man and the production man in the factory. Newly developed products may require new equipment or changed procedures; material changes must be anticipated in order not to affect adversely inventories. Careful control procedures must be set up to help production departments increase output and quality.

"The sales department must concern itself not only with selling established products but also determining and making known to the technical department any sales requirements."

Other subjects covered in this panel discussion include:

"The Technician and the Raw material Salesman," by J. Robinson of International Paint Co.; "Liaison between Development Laboratory and Factory," by F. Mendes of Walter N. Boysen Co.; "Control Laboratories," by J. Ewell of Pabco Products, Inc.; "Sales Technical Relationship," by P. Hamblin of National Lead Co.; "Technical Field Service," by G. Arhart of Pacific Paint and Varnish Co.

Papers presented included: "Fungus and Fungicide" by Charles Yaeger, technical Director of the Scientific Oil Compounding Co.; "Recent Developments in Iron Oxide Pigments," by Irwin C. Claire, C. K. Williams and Co.; "Vinyl Monomer Modification of Vehicles," by Walter Henson, Coatings Technical Service, the Dow Chemical Co.; "Application of Fluorescent Indicator Adsorption Method to Protective Coatings Solvent, by J. D. Giannotti, El Segundo Laboratories of the California Research Laboratories; and "Present Status of Alkyd and Epoxy Resins in the Coating Industry," by J. M. Thomas of Jones-Dabney Div. of Devoe & Raynolds Co.

Forty-nine firms participated in the Paint Materials and Equipment Show which filled the Gold Room of the Fairmount Hotel and adjoining rooms.

Twenty-four Sherwin-Williams Cleveland branch honored at 25th Anniversary Banquet

Sherwin-Williams Co. Honors Veteran Cleveland Employees

Twenty-four Cleveland employees of the Sherwin-Williams Co., together with their families, were guests of honor at a 25th Anniversary Banquet in Cleveland recently.

These employees observed their quarter-century anniversary with the company during 1953. Every major division of Sherwin-Williams in Cleveland, including general headquarters, plants, and the regional sales office, was represented in the group.

President Arthur W. Steudel presented watches to all members of the group and briefly reviewed the individual history of each employee. Attendence at the dinner totaled 340 persons, including local employees who previously had observed 25 years with the company.

The 24 members of the "Class of 53" bring to 238 the number of active Cleveland employees who have been with the firm a quarter of a century or longer. In addition, 36 local retired employees exceeded 25 years of service.

Approximately 18 per cent of the firm's 1,502 active personnel in Greater Cleveland have helped build the prestige of the "Cover the Earth" emblem for more than 25 years.

Frederick A. Morgan of 3517 W. 44th St., and Charles Ruebner, 4314 W. 48th St., who have completed half-a-century with the company, were honored guests at the banquet. Mr. Steudel presented them with a diamond-studded "Cover the Earth" pin and a cash award.

Two other half-century employees, now retired, also attended the dinner. They were Seaman Ripley and Edwin H. Stinchcomb.

C. F. Toll, National Advertising Manager was toastmaster. A. H. Burt, Vice President and Director of Sales, was the principal speaker. His theme was "Looking Forward". He emphasized the growth of the Sherwin-Williams Co., over the last quarter century and outlined several recent developments by the company which are aimed at insuring that continuity of progress through the years ahead.

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Hudson Paint & Varnish Moves to Improved Plant

In order to provide broader service to its customers, Hudson Paint & Varnish, Inc., Subsidiary of Sun Chemical Corporation, has moved from its former location at 250 Wright Street, Newark, N. J., to improved laboratory and manufacturing facilities in Nutley, N. J.

The new address is: Hudson Paint & Varnish, Inc., Subsidiary Sun Chemical Corporation, 113 East Centre Street, Nutley, N. J.

Hudson Paint & Varnish, Inc. joined Sun Chemical's Paints and Finishes Group of companies, which also includes A. C. Horn Co. and C. A. Willey Co., in January, 1946. Other Division of Sun include General Printing Ink Co., Warwick Chemical Co., Warwick Wax Co. Inc., Electro-Technical Products and Pigments.

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Y. Production Club Honors oia, Venuto and Engelhardt

Three members of the New York Paint and Varnish Production Club received Pa Va C awards at the regular meeting, May 6, 1954. Those receiving the awards are C. A. Aloia, Sun Chemical Corporation; Carl L. Engelhardt, Brooklyn Paint and Varnish Co., Inc. and Louis J. Venuto, Binney and Smith Company.

The Pa Va C award is an honor bestowed on those members of the Club for outstanding contributions to the advancement of the Protective Coatings Industry and the New York Paint and Varnish Production Club.

C. A. Aloia is the assistant General Manager and Chief Technician of the Sigmund Ullman Division of the Sun Chemical Corporation. He has been associated with the Ink Industry for the past twenty-four (24) years and has been an active member of the New York Club since 1935. He has served as an active participating member of the following committees—Program, Nominating, Resolutions, Coordinating, Executive, etc. By his outstanding work on behalf of the Club he was elected to the office of Vice President in 1949 and finally President in 1950.

In Federation matters he has served as Chairman of the Entertainment Committee for the Atlantic City Conventions for 5 years besides serving unselfishly on various other committees of that organization.

He is a member of A.S.T.M. Subcommittee D-1 and is recognized as an outstanding authority on Printing Inks, having written many articles and delivered many lectures on the subject. He is the holder of many patents on new types of printing inks which has benefited both the Printing Ink Industry and his Company.

Carl L. Engelhardt, Technical Director of the Brooklyn Paint and Varnish Company, has been associated with the Protective Coatings Industry since 1931 and has been a Class A member of The New York Paint and Varnish Production Club for the past 22 years. He has served on many committees such as,—Program, Publicity, Executive, Technical, and others. Through his unselfish services to the club, he was elected to the offices of Treasurer, Secretary, Vice-President and finally President in 1947. He also served as secretary of the Technical Committee for eight years and as chairman for seven years. During his chairmanship many technical contributions were made to our industry through the work of the various sub-committees and many prize winning papers at the annual Federation Convention.

He has served on many Federation Committees,—Program, Chairman of the Publicity Committee and was elected as a member of the Executive Committee for a 2-year term.

He is a member of the American Chemical Society, Fellow of the American Institute of Chemists and a member of the American Society of Testing Materials,—his services to these related groups have helped to advance our Industry.

He has been active in Educational programs in high schools and Paint Dealer Associations and through his technical articles and addresses has helped the cause of our industry.

Louis J. Venuto, Research Director of the Binney and Smith Company, has been associated with the Protective Coatings Industry since 1923 and has been active on the Technical Committee of the New York Paint and Varnish Production Club for the past twenty (20) years.

He has served as chairman and member of the various sub-committees working on various problems such as Pigment Dispersions, Properties of Linseed Oil, Camouflage Paint, Blackout Paints, Water Emulsion Systems, etc. Many of these projects resulted in many prize winning papers.

He was one of the sponsors and originators of the Mattiello Memorial Library Collection and the Federation Mattiello Memorial Lecture. He also served as a member of The Mattiello Committee of the Club in 1948. In addition he served on various Federation Committees.

Mr. Venuto started the first laboratory in the Carbon black industry devoted exclusively to the study of Carbon Black in all its phases. His research efforts have been in the field of colloidal dispersion of carbon black in the rubber, paint and ink industry. He has developed many new methods of test used by our industry. His fame and reputation as an outstanding authority on carbon black has spread throughout the world so that he has earned the name of Mr. "Carbon Black." He has written many articles, books and papers relating to our industry and has lectured throughout the United States and Europe on subjects relating to the protective coating industry.

He is a member of the American Chemical Society, Rubber Division of the ACS, New York Printing Ink Club, Chemist Club, Gallows Birds, etc.

the Nuoscope©

these Nuodex aids help you sell mildew-resistant paints

for your salesmen...

a catalog page that simply and briefly gives facts on paint mildew, its causes, its prevalence and the means of combatting it. Space for imprinting. Available in quantity for your sales staff without cost.

for the consumer...

a folder for contractors and retail customers that identifies and shows prevalence of paint mildew. Also recommends use of treated paints to protect against mildew. Space for imprinting. Available in quantity at cost.

for your dealers...

There's Profit in Mildew Resistant Paints, reprint from a dealer publication, shows dealers how this simple, effective treatment can spur sales both to consumers and industry with the promise of paint protection. Available in quantity at cost – imprinted if desired or plain.

for your painters...

Painting Food Processing Plants, a trade journal reprint on industrial maintenance paints. Points up need for mildew-resistant interior coatings in food processing plants or anywhere high humidity conditions exist. Available in quantity at cost—imprinted if desired or plain.

film facts...

a slide film tells the story of paint mildew and its control. Available on loan basis for showing at sales or technical meetings, or to distributors, dealers painting contractors, service clubs.

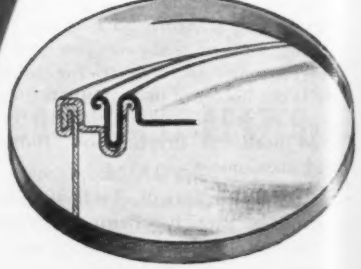
For complete information on these and other sales aids, write to Nuodex.

NUODEX

NUODEX PRODUCTS CO., INC.
Elizabeth, N. J.

Isn't today a good time to ask about tailor-made package service?

Before you order another paint can, why not see what Continental's Tailor-Made Package Service can do for you. Our interest in our customers goes far beyond supplying the best in paint cans without an instant's delay. We're also concerned with keeping your operations flowing smoothly, your products up to standard. That's why we make available expert engineering and research to fit your particular needs. In all our dealings with you, we will treat you as if you were our one and only customer. Let's get better acquainted — today.



PUT YOUR PAINT in a container you can brag about . . . Continental's "Tripletite"! In lid and lid seat, metal touches metal at three points instead of the usual two. The result is a 50% increase in guard points against oxidation and messy paint skin.

Commercial Solvents New St. Louis Office

The new address of the St. Louis District Sales Office of Commercial Solvents Corporation is 7890 Folk Avenue, St. Louis 17, Missouri. The new telephone number is Mission 5-3330.

•

Clifford L. Iorns Co. Handling Additives of Troy Chemical Co.

Elias Singer, Tech. Dir., of the Troy Chemical Company manufacturers of additives and specialties, announces the appointment of the Clifford L. Iorns Co., with offices at 216 South 7th Street, St. Louis 2, Missouri as their exclusive representative in the State of Missouri.

Cleveland Production Club Presents Interesting Telecast

The Cleveland Paint and Varnish Production Club presented what probably will be the first telecast by any Production Club. Their program, "The Search For Prefection" was televised on Sunday April 11th over WNBK channel 4 in Cleveland. It was one in a series of telecasts on science careers sponsored by the Cleveland Technical Societies Council.

The telecast was an ambitious undertaking of the Cleveland Club's Educational Committee headed by Robert F. Hall. The script was written by Dr. E. G. Bobalek of Case Institute of Technology.

The cast included Robert F. Hall of United Cooperatives, Inc., John C. Weaver of Sherwin Williams Company, Humphrey W. Dell of the Glidden Company, Eugene H. Ott of Ferbert Schorndorfer Company, William M. Tomc of Acorn Refining Company and a high school student.

Hercules Powder and Alabama By-Products Plan Ammonia Production

The Alabama By-Products Corporation, of Birmingham, Alabama, and Hercules Powder Company, have announced that they were engaged in working out plans for a joint undertaking for the production of anhydrous ammonia in a new plant to be located in the vicinity of Birmingham.

Capacity of the plant will be 45,000 tons annually.

The new plant will be the first commercial producer of ammonia east of Memphis, Vicksburg, and New Orleans on the Mississippi and south of Virginia. Agricultural and industrial consumers in this area are expected to benefit from the new plant through lower transportation costs and increased source of supply.

To be located in the Birmingham area near the Alabama By-Products Corporation's Tarrant Works, construction on the new plant is expected to begin within a few weeks' time, with completion scheduled for 1955.

New Cargill Solvent Extraction Plant for Linseed Oil in Operation

Cargill, Incorporated, processors and refiners of vegetable oils, have announced that their new solvent extraction plant for linseed oil is now in full production at Minneapolis. This electronically controlled plant is said to be the first linseed plant of its kind in America.

This expansion, according to Cargill officials, has been forced by the growing demand for high quality linseed oils. Not only was volume expansion required, but it had to be expansion in the high quality, light colored oil that naturally produces better refined special oils.

Cargill engineers report that everything has been done to make the linseed oil from this modern plant the finest in the industry. Particularly, mild operating temperatures, almost complete electronic controls, and tight quality control are combined to get this result.

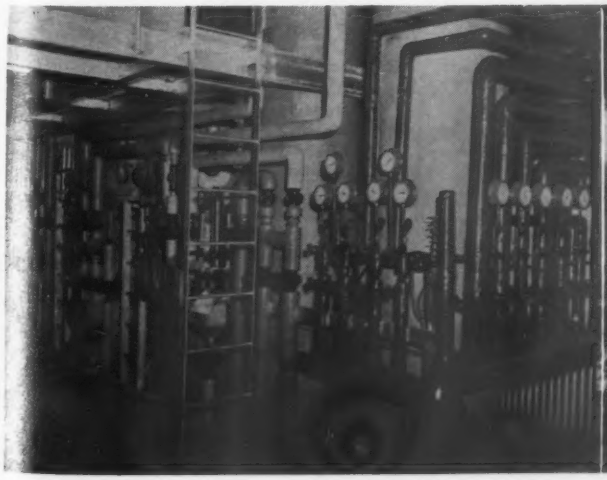
These engineers now also state that the new plant will produce this improved linseed oil at lower costs. In addition, the new facilities about double Cargill's total capacity at the Minneapolis plant site.

Faced with the construction of an entirely new plant and with a demand for nothing but top quality oil, Cargill engineers were in the happy position of being able to write their own ticket on processes and equipment.

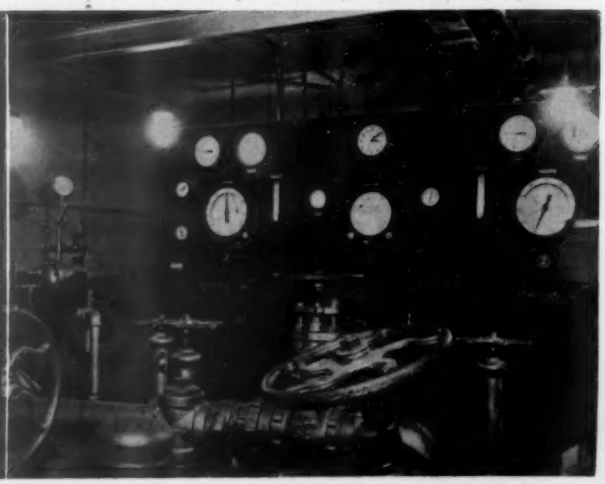
They finally chose to use the Belgian DeSmet solvent process and equipment. This is familiar and tested equipment to the Cargill engineers who already have America's first DeSmet equipment in operation at San Francisco where the company has a copra plant. The success of this West Coast installation in producing quality oils at low cost, plus its smooth and efficient functioning, indicated that this process could be applied to linseed oil as the biggest possible step forward in both improving quality and increasing production.

According to Fred M. Seed, Vice-President, "It is part of our company's philosophy of creative processing to take the lead in the development of a new plant like this one at Minneapolis. It is part of our long range plan we hope will mean better markets for flaxseed producers and better linseed and special oils for users everywhere."

Controls for distillation units permit accurate regulation of process to remove light linseed oil from solvent.



Instrument panel provides temperature control to polymerize under vacuum at specified temperatures in processing.



ONE SOURCE:

Resins for coatings that withstand roughest service

You have performance proof that your coatings can take the severest conditions of service when you rely on BAKELITE as your one source for simplified purchase of major synthetic resin requirements. Formulations recommended by BAKELITE have been laboratory-developed, extensively field-tested. Many case-histories prove superior performance.

Regardless of conditions under which your coatings must stand up—temperature, humidity, exposure to or contact with gases, acids, alkalies and other chemicals—the extremely large number of BAKELITE Resins and formulations available allow you to choose with confidence. Protect your good name by using resins of proven performance.

Remember, there is a tremendous industrial market for coatings . . . and BAKELITE is the one source of more types of resins for coatings than any other.

FOR EXAMPLE: Here are some of the industries and uses for coatings made from *just one* type of BAKELITE Resins— BAKELITE Phenolic Resins for baked finishes.

Air Conditioning and Ventilation
- Rotors
- Blowers
- Fans, blades, and housings
- Ducts
- Ventilators
- Angle irons
- Frames

Biologicals and Pharmaceuticals
- Ampule trays
- Bacteria culture trays

Chemical Processing
- Photographic developing trays
- Acid pickling vats
- Degreasing tanks
- Heat exchanger tubes and surfaces
- Pipe lines
- Brine tanks
- Reaction kettles
- Boiler pipes
- Screen filters
- Pump impellers
- Formaldehyde tanks
- Exhaust fans
- Solvent containers
- Balances
- Chlorinating apparatus
- Mustard gas containers
- Agitators

Hardware
- Mechanics' tools
- Door handles
- Hinges
- Escutcheon plates
- Small fittings

Food Processing
- Dough pans
- Food containers
- Fruit boiling tanks
- Citrus fruit tanks and railroad cars
- Caps and closures
- Food and milk cans
- Equipment for dehydrating eggs
- Pasteurizing equipment

Liquor Industry
- Distillery processing equipment
- Storage equipment
- Beer and wine tanks and railroad cars
- Wine presses
- Pipe fittings

Optical Instruments
- Microscopes
- Transit parts
- Binocular cases
- Flood light reflectors
- Sextants
- Surveying equipment
- Fire control parts

Petroleum
- Storage tanks
- Heat exchangers
- Gasoline cans and drums

Pulp and Paper Industry
- White water lines
- Stock lines
- Pipe fittings
- Screen bodies
- Screen cover plates
- Decker bodies
- Flow boxes
- Bird screens
- Screen parts
- Back plates
- Slice plates
- Shower pipes
- Spider segments
- Filter bodies
- C.I. end plates
- Saveall bodies
- Stock chests
- Shafts
- Stuffing boxes
- Wall frames
- Tanks and vats
- White water pans
- Apron boards
- Table roll baffles
- Slice parts
- Pond plates
- Couch roll
- Fans
- Bearing supports
- Wall inserts

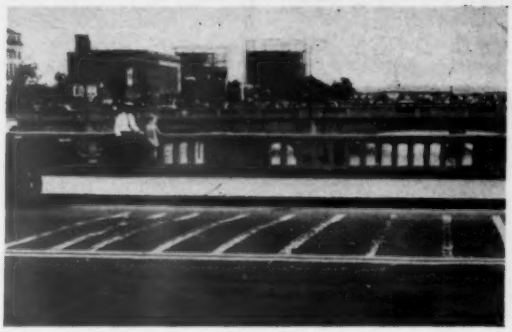
Ships
- Propellers
- Gyroscopes
- Interior of oil tankers
- Drinking water storage tanks
- Ballast tanks
- Submarine fittings
- Compass parts
- Brass hardware

Textiles
- Paper tubes
- Spinning pots
- Spinning bobbins

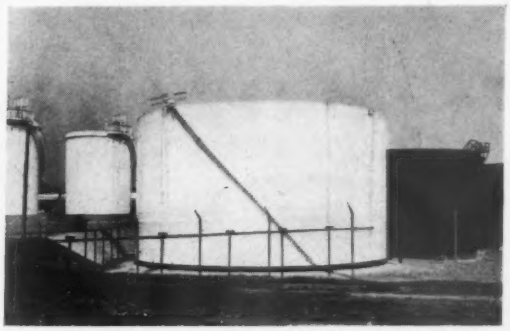
Water Treatment
- Purification systems
- Boilers
- Water cans

Miscellaneous
- Interior parts of aircraft engines
- Aircraft engine parts
- Razor blades and razors
- Vanity cases
- Ash trays
- Belt buckles
- Cigarette cases
- Clock cases
- Cartridge cases
- Uniform buttons
- Lamps
- Hand railings
- Electrical insulation

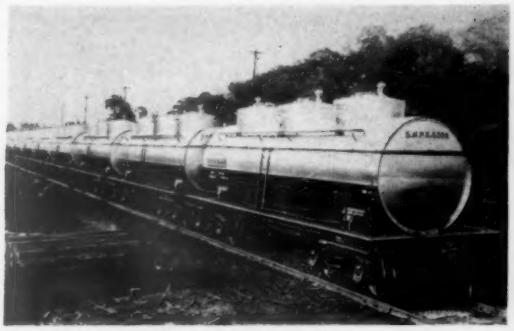
Coatings to resist chemicals—At the South Charleston plant of Carbide and Carbon Chemicals Company, a Division of Union Carbide & Carbon Corp., coatings based on BAKELITE Vinyl Resins applied to acid concentrator tanks remain unharmed after over four year's exposure to sulphuric acid spillage. In contrast, all commercial coatings previously used on these tanks broke down after less than one month's service.



Coatings to stand rough use—Tested against ten other coatings, traffic paint based on BAKELITE Phenolic Dispersion Resins, was the only coating that stood up under the wear of 17,000 cars daily for six months. In addition, the quick drying time, as low as 15 minutes, offers a minimum of interference with traffic flow. Traffic coatings based on BAKELITE Resins have therefore been adopted by many Federal, State and Municipal authorities.



Coatings to resist weather extremes—Hot southern sun, salt air and high humidity have not been able to harm the coatings of these marine terminal oil tanks. Where former coatings failed, a wash primer and topcoat, both based on BAKELITE Resins have remained in excellent condition over several years. Light colors were used to provide maximum reflection of heat and sunlight, reducing tank temperature and protecting against excessive evaporation of contents.



Coatings to resist organics—Bulk transportation of wine in 376,000-gallon tank cars has been made possible by interior coatings based on BAKELITE Phenolic Resins. They provide a hard surface impervious to the chemical effect of wine, and to vibration of equipment. Sterilization after each trip with live steam is standard procedure and is not harmful to the coating in any way. Equally dependable resistance to oils, grease, foods and other organics is provided by coatings based on BAKELITE Resins.

There are many data sheets showing formulations, manufacturing procedure and properties of finished coatings. Manuals describe different resins and their uses. There are formulations to meet government specifications, and booklets that can show your customers how coatings based on BAKELITE Resins protect structures and equipment in practically every industry. Send the details of your problem so that the most applicable data can be returned to you.

Technical help. Fifteen sales offices bring one-source service close to your plant. Personnel trained in the development of resins and formulation, and processing techniques provide helpful technical assistance.

BAKELITE
TRADE-MARK
VINYL, PHENOLIC AND STYRENE
RESINS for COATINGS

TRADE MARK

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

Tall Oil Association Holds 7th Annual Meeting

Confidence in the outlook for tall oil and tall oil products—chemical raw materials used in soaps, paints, linoleum and other fields—was expressed at the seventh annual meeting of the Tall Oil Association held recently in New York.

Albert Scharwachter, vice-president of Arizona Chemical Company, was for the third successive year re-elected president of the Association, whose membership includes 14 of the nation's leading manufacturers and sellers of tall oil.

Artcher E. Griffin, sales manager of the Chemical Division, Camp Manufacturing Company, Inc., Franklin, Virginia, was re-elected vice-president of the Association, which was organized in 1947 to promote the use of tall oil. Dernell Every continues as secretary and treasurer and T. K. Heston as assistant secretary-treasurer.

A complete statistical review was presented at the morning session, at which the growing use of tall oil products in the soap, paint, linoleum and floor covering fields was discussed. Other markets in which tall oil products are used were also included.

Tall oil products represent the most economical organic fatty acid source, it was explained. Tall oil and tall oil products have a stable source of raw material from the waste or spent liquor resulting from the rapidly growing sulphate or kraft pulp manufacturing industry in the South. Thus, it was emphasized, tall oil products are increasingly being used to replace higher priced fatty acids, the price and supply of which are dependent on weather, crops, imports and other uncontrollable and more speculative factors.

Sessions at the afternoon meeting were devoted to discussions among technical and research men representing the organization's membership on the latest developments of tall oil and tall oil products. Among the technical problems discussed were the compatability of treated tall oil with alkyds, the solubility and viscosity of tall oil in mineral spirits, the effect of pour point depressants on tall oil, the effect of anti-oxidants on preventing the drying of tall oil esters and the establishment of standard methods for sample tall oil.

"Tall oil products are now finding successful application in at least a dozen important industries," Dr. Arthur Pollak, technical consultant to the Tall Oil Association, told the members at the afternoon meeting.

"As a result of research and experimentation now under way not only among members of the Association but especially among users of tall oil products it can be confidently predicted that an increasing number of new uses will be found for tall oil in the near future. As a matter of fact, crude tall oil production, which is now running at the rate of 160,000 tons a year may very well be doubled by 1960, an annual rate previously predicted."

Representatives of the following member companies participated in the discussions at the Tall Oil Association's annual meeting: Albemarle Paper Manufacturing Co., Arizona Chemical Co., Brunswick Pulp & Paper Co., Camp Manufacturing Co., Champion Paper & Fibre Co., Continental Can Co., Crossett Chemical Co., Gaylord Container Corp., National Southern Products Corp., Newport Industries, Inc., North Carolina Pulp Co., Southern Advance Bag & Paper Co., Union Bag & Paper Corp., and West Virginia Pulp & Paper Co.

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Emery Announces Increased Supply of Plasticizer Line

The Plastolein Plasticizers are now available in greatly increased quantities. The most popular of these, Plastolein 9058 DOZ (di-2-ethylhexyl azelate) and 9057 DIOZ (di-iso-octyl azelate).

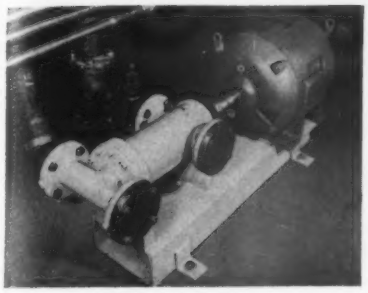
This stepped-up production is the consequence of Emery's ozone-oxidation plant. This pioneering venture into the first large-scale commercial use of ozone involves the oxidation of oleic acid, a basic product of Emery, into two unique C_9 aliphatic acids, dibasic azelaic and monobasic pelargonic. In addition to the use of these acids in plasticizers, both have extensive potential use as raw materials in alkyd resins, polyesters, polyamides, soaps and chemical intermediates.

NATIONAL CAN
. . . industrial, handyman or maintenance products has produced a rugged type of can construction engineered to meet and withstand repeated use and abuse. In this development—the NC team of production expert — research chemist and merchandising counsel have gone further than merely producing a "can." They have produced "selling" containers with long life and complete dependability. A call or a wire will bring you more specific information — no obligation, of course.
PAINT
NC
NATIONAL CAN
CORPORATION
Plants At BALTIMORE, MD. • CHICAGO, ILL. • MASPETH, N.Y.
CLEVELAND, OHIO • HAMILTON, OHIO and WARREN, OHIO

NEW MATERIALS & EQUIPMENT

A MONTHLY MARKET SURVEY

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.



CAZENOVIA

COLLOIDAL MILL

Self-Contained

Disc disperser or colloidal mill is claimed by the manufacturer to have the following features: produces smooth products, increases yield, reduces off-grade batches, develops shorter production cycles, and saves power costs. It is said that no cooling apparatus is required due to the negligible amount of heat generated, which indicates a substantial increase in operational performance and efficiency of these mills. The knives of this disc provide positive shearing action on the material instead of the usual tearing that generates a terrific amount of frictional heat. For complete information on this disperser, write Cazenovia Precision Machine Co., East Aurora, N. Y.

MASKING AGENT

Useful in Latex Paints

"Citrascent Reodorant" volatilizes at about the same rate as conventional paint thinners. When it is added to paint, it has the property of cancelling out the odor characteristic of paint thinners as the paint is being applied. The manufacturer reports that this material is useful in latex paints, particularly those that require preservatives to control mold growth. The odor of this additive is strong citrus. Kauri-Butanol range is 57-62; color, Gardner 12 to 14. For further information, write to Florida Molasses Corp., Box 366, Auburndale, Florida.

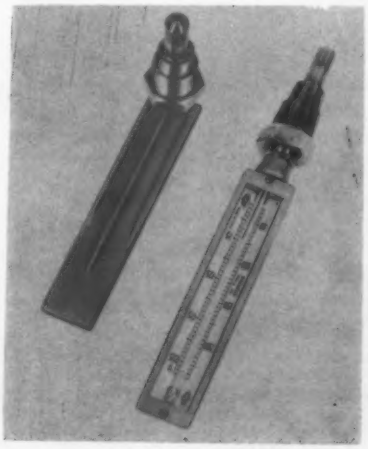
INDUSTRIAL THERMOMETERS

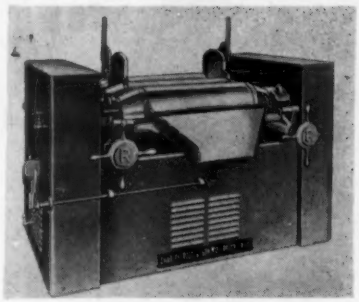
Adaptable for Restricted Space

Line of 5" scale, mercury-in-glass industrial thermometers are furnished with separable sockets. Designed specifically for restricted-space applications, these thermometers are offered in a choice of five different case angles: straight, 90 deg. rear angle, 90 deg. right and left side angles, and 135 deg. oblique angle. Available in five different scales: -40 to 110 degrees F., 30 to 180 deg. F., 30 to 240 deg. F., and 30 to 350 deg. F., and 200 to 500 deg. F.

The separable socket is said to offer protection for the bulb against process conditions and also permits the thermometer proper to be removed, if necessary, without leaving an opening in the line or apparatus. The sockets are threaded and are available in brass, steel, and stainless steel. Precision Thermometer & Instrument Co., Philadelphia, Pa., 1434 Brandywine St., Philadelphia 30, Pa.

PRECISION





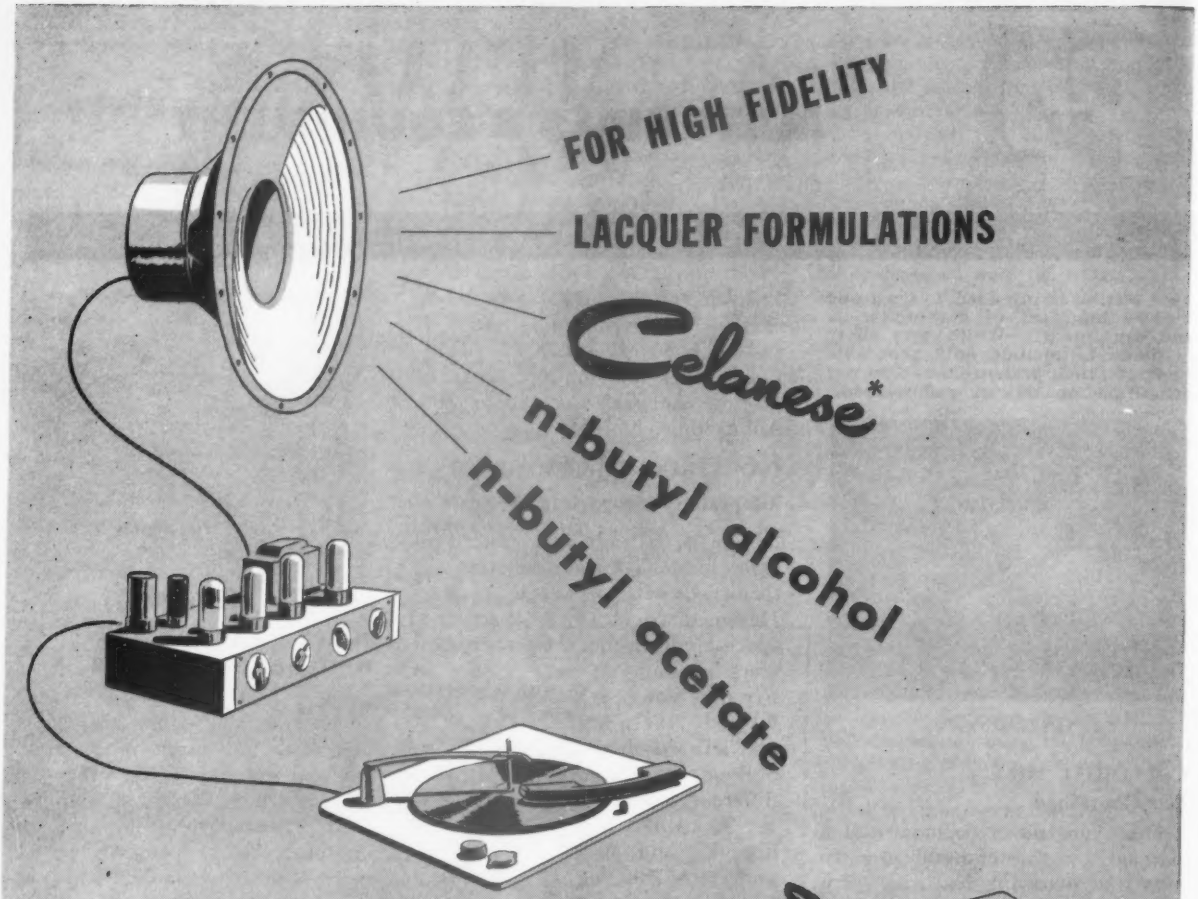
CHARLES ROSS

THREE ROLL MILL

With Fixed or Floating Roll

High speed three roll mill (#52-TC) can be operated as a conventional mill with fixed center roll and four point adjustment, or with floating center roll with two point adjustment, according to the manufacturer. When differences in pressure between feed and take-off rolls are desired, the center roll is in fixed position. When equalized pressures are preferred, the same mill can be converted to have self-aligning or floating center roll. It is reported by the manufacturer that conversion from one type of operation to the other is easily accomplished without special tools or kits, and without special skill by any operator.

Other features claimed are: higher ratio of differential speeds for greatest shear; adjustable apron for raising or lowering knife contact point or varying apron angle on front roll, permitting flexibility; balanced apron provides constant uniform pressure of knife on front roll as the knife wears which is said to give continuous thorough takeoff of material from front roll and by preventing dispersed material from cycling back into the mill, giving maximum production; manual adjustment of rolls are provided with ball thrust bearings on adjusting screws to facilitate turning of handwheels. For further information, write to Charles Ross & Son Co., 148-156 Classon Ave., Brooklyn 5, N. Y.



FOR HIGH FIDELITY

LACQUER FORMULATIONS

Celanese*

n-butyl alcohol

n-butyl acetate

Lacquer chemists agree that synthetically produced solvents have the edge—on uniformity, purity, dependability of supply, and price stability.

When you requisition Celanese n-Butyl Alcohol and n-Butyl Acetate, you get all the advantages of basic synthetic production—integrated raw material supply, continuous operation, petrochemical quality control. You have the added economy of combination shipments of these solvents with other Celanese Solvents (n-Propanol, Isobutanol, Acetone, n-Propyl Acetate, 901 Acetate, Methanol, and the low-cost Celanese Special Solvents)—in compartmented tankcars and tankwagons. Convenient Celanese distribution centers assure you time-table delivery.

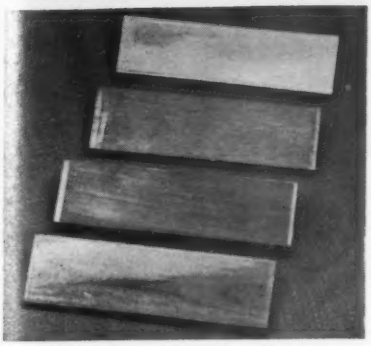
Celanese*

*Reg. U.S. Pat. Off.

CHEMICALS

CELANESE CORPORATION OF AMERICA · CHEMICAL DIVISION · 180 MADISON AVENUE · NEW YORK 16, N.Y.

NEW MATERIALS — EQUIPMENT



DOW CORNING

SILICONE COPOLYMERS
Imparts Added Properties

Copolymers of silicone and oil-modified phenolic resins are designed, according to the producer, to supplement conventional phenolic resins for applications where added resistance to heat, weathering, chemicals and moisture is desired. The copolymers are identified as XR-875 and XR-859, containing 25% and 50% silicone respectively. Claims concerning these copolymers are as follows:

Spar varnishes based on XR-875 show good color retention after 1000 hours of accelerated weathering test; those formulated with XR-859 not only held their color, but also retained 90% of their original gloss; silicone-phenolics air dry to a hard film in 16 hours or less; water and chemical resistance of the silicone phen ic films is better than comparable silicone alkyds, baking provides excellent film properties in the 400-500 deg.F range.

These copolymers are soluble in mineral spirits and are compatible with alkyd and phenolic varnishes. Properties suggest their use in spar varnishes, maintenance paints and specialty coatings. Laboratory quantities available at the present time. Increased resistance to chalking and fading of spar varnishes (see photo) based on the silicone-phenolic resins is demonstrated by their appearance after 1000 hrs. of accelerated weathering. From top: control, conventional phenolic, varnish based on XR-875, and varnish based on XR-859. Dow Corning Corp., Midland, Mich.

THE SOLVENTS AND CHEMICALS GROUP

TOPS in TECHNICAL SERVICE from Alcohol to Xylol

Aliphatic Petroleum Naphthas
Alcohols and Acetates
Aromatic Solvents, Petroleum and Coal Tar
Chlorinated Solvents
Glycols and Amines
Ketones and Ethers
Naval Stores
Oils and Fatty Acids
Plasticizers
Stearates
Waxes

WANT quick, helpful suggestions for the solution of technical problems involving solvents and chemicals? Call your nearby member of the Solvents and Chemicals Group. Here's why . . .

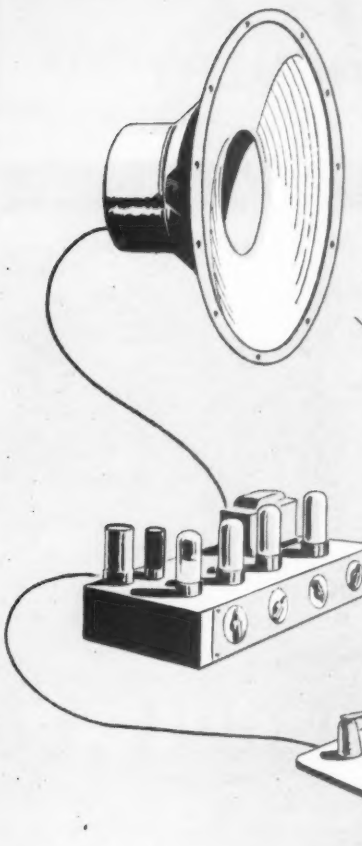
1. Each member maintains laboratory facilities to help serve industry as well as control quality and purity of incoming products.
2. Each group member has technically trained men familiar with problems in the industries they serve.
3. Each member is free to call on the technical departments of its nationally-known principals. Members welcome an opportunity to provide assistance on any bona-fide problem in the areas in which they serve.

Unbiased technical service is just one more reason for choosing Solvents and Chemicals Group members as your source of supply. Investigate this modern, time-saving, money-saving service that supplies *what* you want . . . *when* you want it . . . *where* you need it . . . all with just *one phone call*! Call your nearby Group member or write . . .

THE SOLVENTS AND CHEMICALS GROUP

2540 WEST FLOURNOY STREET, CHICAGO 12, ILLINOIS

BUFFALO, Bedford 1572
CHICAGO, SEeley 3-0505
CINCINNATI, MElrose 1910
CLEVELAND, CLearwater 1-3770
DETROIT, WAlnut 1-6350
FORT WAYNE, ANthony 0213
GRAND RAPIDS, Grand Rapids 5-9111
HOUSTON, Orchard 6683
INDIANAPOLIS, ATlantic 1361
LOUISVILLE, Wabash 3393
MILWAUKEE, GReenfield 6-2630
NEW ORLEANS, Temple 4666
ST. LOUIS, GArfield 3495
TOLEDO, Jarden 0761
WINDSOR, Clearwater 2-0933



FOR HIGH FIDELITY

LACQUER FORMULATIONS

Celanese*

n-butyl alcohol

n-butyl acetate

Lacquer chemists agree that synthetically produced solvents have the edge—on uniformity, purity, dependability of supply, and price stability.

When you requisition Celanese n-Butyl Alcohol and n-Butyl Acetate, you get all the advantages of basic synthetic production—integrated raw material supply, continuous operation, petrochemical quality control. You have the added economy of combination shipments of these solvents with other Celanese Solvents (n-Propanol, Isobutanol, Acetone, n-Propyl Acetate, 901 Acetate, Methanol, and the low-cost Celanese Special Solvents)—in compartmented tankcars and tankwagons. Convenient Celanese distribution centers assure you time-table delivery.

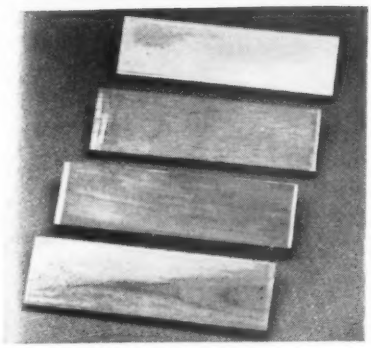
Celanese*

CHEMICALS

*Reg. U. S. Pat. Off.

CELANESE CORPORATION OF AMERICA · CHEMICAL DIVISION · 180 MADISON AVENUE · NEW YORK 16, N.Y.

NEW MATERIALS — EQUIPMENT



DOW CORNING

SILICONE COPOLYMERS
Imparts Added Properties

Copolymers of silicone and oil-modified phenolic resins are designed, according to the producer, to supplement conventional phenolic resins for applications where added resistance to heat, weathering, chemicals and moisture is desired. The copolymers are identified as XR-875 and XR-859, containing 25% and 50% silicone respectively. Claims concerning these copolymers are as follows:

Spar varnishes based on XR-875 show good color retention after 1000 hours of accelerated weathering test; those formulated with XR-859 not only held their color, but also retained 90% of their original gloss; silicone-phenolics air dry to a hard film in 16 hours or less; water and chemical resistance of the silicone phenolic films is better than comparable silicone alkyds, baking provides excellent film properties in the 400-500 deg.F range.

These copolymers are soluble in mineral spirits and are compatible with alkyd and phenolic varnishes. Properties suggest their use in spar varnishes, maintenance paints and specialty coatings. Laboratory quantities available at the present time. Increased resistance to chalking and fading of spar varnishes (see photo) based on the silicone-phenolic resins is demonstrated by their appearance after 2000 hrs. of accelerated weathering. From top: control, conventional phenolic, varnish based on XR-875, and varnish based on XR-859. Dow Corning Corp., Midland, Mich.

THE SOLVENTS AND CHEMICALS GROUP

TOPS in TECHNICAL SERVICE from Alcohol to Xylol

Aliphatic Petroleum Naphthas
Alcohols and Acetates
Aromatic Solvents, Petroleum and Coal Tar
Chlorinated Solvents
Glycols and Amines
Ketones and Ethers
Naval Stores
Oils and Fatty Acids
Plasticizers
Stearates
Waxes

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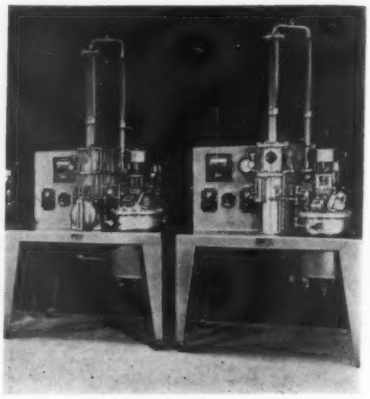
MILWAUKEE, GReenfield 6-2630
NEW ORLEANS, Temple 4666
ST. LOUIS, GArfield 3495
TOLEDO, Jordan 0761
WINDSOR, Clearwater 2-0933

NEW MATERIALS — EQUIPMENT

VINYL ETHER POLYMERS
For Adhesives

Vinyl ethyl ether polymers is said to be useful in the formulation of pressure-sensitive adhesives. According to the producer, such adhesives are characterized by their stability, lack of color, uniformity, and other desirable properties. Feeding tests conducted on laboratory animals indicate that toxicity should not present a problem because of its low order of magnitude.

These polymers are offered in two molecular weights: one is a low molecular weight and is an extremely viscous liquid at room temperatures; the other is a medium high molecular weight and is a rubber-like solid with a faint tack. These two polymers are compatible in all proportions allowing the formulator wide latitude in controlling adhesive and cohesive strength. Bakelite Co. 30 E. 42nd St., New York 17 N. Y.



BRIGHTON

RESIN LAB KETTLES
Three Models

Models A-110 and A-110-A synthetic resin lab kettles are built of Type 316 stainless steel, have a variable speed drive explosion proof motor, and are electrically heated for pressure or vacuum cooking. Model A-110-A is designed for both synthetic resins and organic reactions. From left to right (see photo) model A-110 and model A-110-A. For further information on Brighton Synthetic Resin Lab Kettles write to Brighton Copper Works, Inc., Dept. K, 820 State Ave., Cincinnati 4, Ohio.

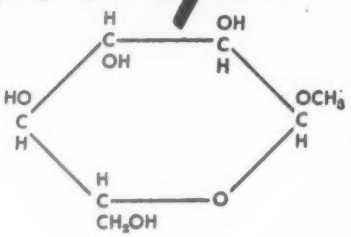
VINYL EMULSION
For Floor Waxes

U-2001 Ubatol is a vinyl polymer emulsion which is said to impart high gloss, water resistance, durability, and washability characteristics to self-polishing floor waxes. This emulsion is compatible with carnuba and microcrystalline waxes and shellac. Tests show that this emulsion is unaffected by repeated freeze-thaw cycles, and because of good chemical and mechanical stability it can be stored for long periods of time without deterioration. For best results, the manufacturer recommends that the emulsion should be plasticized with such plasticizers as dibutyl phtahlate or dibutoxyethyl phtahlate. Viscosity of the emulsion can be increased up to 50,000 cps by addition of thickening agents. Union Bay State Chemical Co., 491 Main St., Cambridge 42, Mass.

Here's a New Polyol

for

PROTECTIVE COATINGS



Argo Brand Methyl Glucoside is a commercially available, low priced polyhydric alcohol.

If you are interested in a compound esterifiable with linseed oil fatty acids to obtain rapid bodying and fast drying oils, Methyl Glucoside is what you want.

If you are interested in rapid drying, well adhering varnish preparations, Methyl Glucoside is the polyol to try.

If you are interested in tall oil esters with higher body and quicker drying properties, Methy Glucoside with either glycerol or pentaerythritol is the answer.

In fact, if you are interested in any formulation involving esterification or alcoholysis reactions, Methyl Glucoside will be important to you.

Methyl Glucoside is now supplied in 100-pound multiwall paper bags. Samples and technical information are also available. Send in your request today.

"Fine Chemicals from Corn"

Chemical Division

CORN PRODUCTS REFINING COMPANY

17 BATTERY PLACE • NEW YORK 4, N. Y.

PAINT is a house's best friend

Paints that make happy houses properly utilize TITANOX® white titanium pigments. Wherever brightness or whiteness is needed, there TITANOX is first choice for consistent satisfaction.

From the full lines of "pure" and composite TITANOX white pigments, you can select one or a combination to fit any type of bright coating that makes a happy house.

Your TITANOX representative and our Technical Service Department are always ready to help you make the right choice. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

2365

TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

NEW MATERIALS — EQUIPMENT

SOLUBLE BORATE

For Fire-Resistant Coatings

Highly-soluble borate is said to be adapted for the preparation of washable fire-resistant coatings. Known as "Borotherm", this chemical is described by the producer as inexpensive and relatively neutral and is intended for use with water-based coatings.

The manufacturer claims that the primary function of this material is to give fire-resistant properties to coatings to meet Dept. of Commerce specifications CS-42-49 (Class F) and Federal Specification SSA-118-a when used with latices and dispersions. Especially adaptable for use with coating grade of polyvinyl acetate.

Technical information is available by writing to American Potash & Chemical Corp., 3030 W. Sixth St. Los Angeles, 54 Calif.

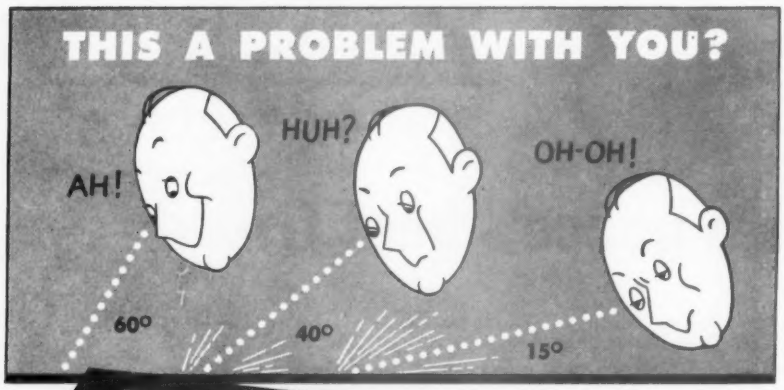
CHLORINATED RUBBER

In Emulsion Form

Unpigmented clear emulsion is available under the trade name, "Rubalt" PE-16 Clear. The manufacturer claims that in achieving the stable emulsification of chlorinated rubber "parlon" without oil modification, not only are all the great advantages of this particular resin retained, but such problems as heavy brush pull and strong solvent odor are eliminated without the use of oil modification as is necessary in the solution-type of chlorinated rubber coatings. It is said that pigmented coatings made with this emulsion find use on lime-bearing surfaces, exterior or interior, especially for exterior masonry applications or other porous surfaces. Company says case histories show that pigmented chlorinated rubber emulsions have lasted for as long as 14 years.

According to the manufacturer, stable, pigmented, water-thinnable, chlorinated rubber paints in a wide range of colors can be produced by simply stirring in pigment and extenders into the clear emulsion without the need for any milling.

For further information, write to Alfred Hague and Co., 227-34th St., Brooklyn 32, N. Y.



DICALITE Flatted paints are FLAT from all angles!

If you have the problem of flat paints being perfect at the "standard" 60° angle, but showing too high a sheen at lower angles, Dicalite L-5 can help you. This Dicalite Flatting Agent produces paints that are flat from *any* angle, because of the unique structure of the diatom particles, their fineness and their great surface area. In rooms with long unbroken wall or ceiling areas, paints flatted with Dicalite will not glare or shine at any angle.

Also, in producing egg shell or semi-gloss finishes, Dicalite Extenders and Flatting Agents give accurate and reliable control of gloss to any degree desired—and the control is easy, not "critical." Dicalite is available in several grades, with a wide range of properties to fit them for the production of all kinds of finishes. Data and suggested formulations on request. Write for Bulletin C-21.

Dependable GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

DICALITE DIVISION
GREAT LAKES CARBON CORP.
614 S. FLOWER STREET
LOS ANGELES 17, CALIF.

HAND CREAM

Prevents Dermatitis

"Kerodex", a medically—tested hand cream is said to provide maximum protection against skin hazards. The manufacturer claims that this cream protects against contact dermatitis due to primary irritants as well as against sensitizing agents encountered on the job. Company tests have indicated that this cream has found to be successful in rubber, plastics, paints, lithography, oil, chemical fields, etc. The cream provides a protective coating which is invisible and yet strong and as elastic as the skin itself; protects for 3-4 hours. Ayerst Laboratories, Inc., 22 E. 40th St., New York 16, N. Y.

AMYLAMINES

Varied Uses

Semi-commercial quantities of amylamine, diamylamine and triamylamine are said to be useful in the preparation of oil-soluble products. These include oil soluble catalysts, oil-soluble corrosion inhibitors, oil-soluble acid acceptors and extractants, and as intermediates for the production of oil-soluble rubber, surface-active agents. According to the manufacturer, diamylamine and triamylamine salts are useful acid corrosion inhibitors in aqueous systems. Sharples Chemicals, Inc., 1100 Widener Building, Philadelphia 7, Pa.

Socrates was in search of truth, not an easy thing to find. If you are in search of fatty acids, you have a much easier job. But, of course, you want the best.

The SOYA BEAN FATTY ACIDS that A. Gross and Company produces are light in color, high in free fatty acid content and extremely stable. You can look far and wide before you will find anything that equals their quality and uniformity, and that exceeds the demands of alkyd resin producers for minimum color and chemical change under heat.

LOOK AND SEE...

	GROCO 28	GROCO 27
Titre	25°— 30°C.	25°— 30°C.
Color 5¼" Lovibond Red	2 — 4	5 — 10
Color 5¼" Lovibond Yellow	10 — 30	30 — 60
Color Gardner 1933	2 — 4	3 — 5
Color Gardner 1933— After Heat Test to 500°F.	4 — 7	
Unsaponifiable	0.3%— 1.5%	3.0% max.
Saponification Value	198 — 202	195 — 200
Acid Value	197 — 201	194 — 199
Iodine Value (WIJS)	125 — 135	122 min.

M A N U F A C T U R E R S S I N C E 1 8 3 7

Get maximum performance from the materials you use for the materials you make. Look and see for yourself that A. Gross can meet your requirements.

BETTMANN ARCHIVE

A. GROSS & COMPANY

295 Madison Ave., New York 17, N. Y.
Factory, Newark, N. J.
Distributors in Principal Cities

Harshaw Driers help maintain your reputation for quality!

In fact, Harshaw Driers protect *two* reputations for quality—yours *and* ours. To make sure they do, strict Harshaw manufacturing specifications demand the following tests on every batch of driers produced at our plant:

- **Metal content**
- **Specific gravity**
- **Color**
- **Viscosity**
- **Total solids content**
- **Flash point (T.C.C.)**
- **Moisture content**
- **Acid value**
- **Miscibility with raw linseed oil**
- **Miscibility with mineral spirits**
- **Benzene insoluble content**
- **Customer's specified tests**

Material released for shipment complies with the strict tolerances necessary for top quality.

Remembering these exhaustive tests, you can order your next batch of Harshaw Driers with the full assurance that they *will* help to maintain your reputation for quality.

LIQUID DRIERS

- **Uversol (Naphthenate) Liquids**
- **Linoresinate Liquids**
- **Lo-Odor Liquids**
- **Linoleate Liquids**
- **Lithos**
- **Octasols**
- **Pastes**
- **Pastalls**

SOLID DRIERS

- **Uversol (Naphthenate) Solids**
- **Linoresinate Solids**
- **Linoleate Solids**
- **Soyate Solids**
- **Fused Resinates**

POWDERED DRIERS

- **Precipitated Resinates**
- **Drying Salts:**
  - **Cobalt**
  - **Lead**
  - **Manganese**
  - **Zinc**

HARSHAW

THE HARSHAW CHEMICAL CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

R. G. Allen

R. G. Allen Elected Exec. Vice Pres. of Godfrey L. Cabot, Inc.

The Board of Directors of Godfrey L Cabot, Inc., Boston, Mass. chemicals manufacturing firm, recently announced the election of Mr. Russel G. Allen as Executive Vice President. He succeeds Mr. Thomas D. Cabot, whose election as President of the Company was announced on March 1, 1954.

Mr. Allen joined the Cabot organization in Texas in 1952, two years after his graduation from Haverford College, Pennsylvania. Following five years of service in the Southwest and in West Virginia, in 1930 he was placed in charge of the Southwestern Division with headquarters at Pampa, Texas. In 1943 he was transferred to Boston to become vice president of Godfrey L. Cabot, Inc.

•

Paper on Vinyl Acetate to be Given at Vehicle Group Meeting

Mr. Benjamin Farber, chairman and Mr. Oscar Muller, vice chairman have announced that Mr. R. H. Davis of the Celanese Corporation, will speak on "The Making of Polyvinyl Acetate From The Monomer" at the May meeting of the Vehicle Manufacturers' Group. Mr. Davis plans to show how the various additives affect the film forming properties of the final coating systems. The meeting will be held at the Chemists' Club, 52 East 41st Street, New York, N. Y. at 6:30 P.M. on May 12th.

•

National Lead To Open Paint Plant in Manila

Completion of a plant to produce mixed paints in Manila, Philippine Islands, is scheduled within the next few months as a joint undertaking of National Lead Company and Connell Brothers Company of the Philippines. The new concern will be called National Lead Company (Philippines) and paints produced will be sold under the "Dutch Boy" trade-mark.

Approval of Philippine authorities for the importation of the necessary machinery, spare parts and raw materials has been secured, and the location of a suitable plant site has been chosen. A long-term lease has been signed covering a site in the Tabacalara Compound of Manila, now occupied by a war-damaged building. The owners will rebuild this structure completely, according to architects' plans agreed upon.

D. D. Roberts, manager of National Lead Company's Pacific Coast Branch, announced that Richard Savage, who has for several years been chief chemist at the Los Angeles plant, has been transferred to Manila to supervise installation of machinery and to operate the factory.

•

N. Y. Pigment Club Will Hear M. MacGuffie at May 13th Meeting

The New York Pigment Club will hold their monthly meeting May 13th at Fraunces Tavern in lower Manhattan, New York City. The speaker will be James MacGuffie of the Titanium Pigment Corp.

•

M. B. Sweet of Chicago Named Agent for Brown-Allen

Brown-Allen Chemicals, Inc., Staten Island, N. Y. announces the appointment of M. B. Sweet, 9100 South Park Avenue, Chicago as its agent in that city. Mr. Julius A. Baggiani will be in charge of Specialty oil sales for M. B. Sweet.

FREE

Chemical Progress Week May 17-22

Write today for free literature on Syloid AL-1—prevents pressure build-up in metallic paints—and Syloid 162—alkyd-urea varnish flatting agent. Booklets include chemical and physical properties, use data and information on laboratory and field tests.

Progress Through Chemistry

THE DAVISON CHEMICAL CORPORATION

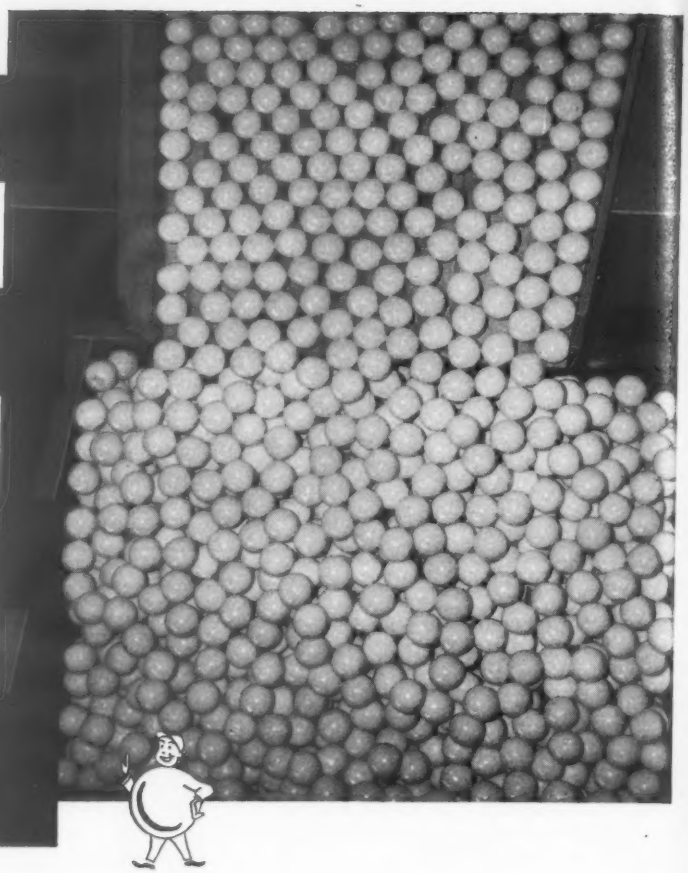
Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS.

Easier on the MILL

Safer for the MIX

Lighter on the COST



McDANEL

35 years ago McDanel developed a vitreous porcelain of tough, stony structure for the making of grinding balls. The Balls made from that porcelain formula were immediately accepted by the Enamel industry—*became the standard!*

Each year of the past 35 has offered new proof of McDanel Balls resistance to impact . . . long and uniform wear . . . drastic lowering of grinding costs. McDanel Balls combine to produce pure, clean, uniform batches at tip-top speed and economy. Use McDanel for A-1, all-around value and service.

Other McDanel Products

Mill Lining Brick
Porcelain or High Density

Special Shapes
Tank Linings

Mill Head Assemblies

Laboratory Jar Mills

Metal Covered Grinding Jars

All Porcelain Grinding Jars

Porcelain Specialties

Write today for catalog containing full data on McDanel Porcelain Products.

Packed in 100 lb. sacks for your protection
Prompt shipment on all sizes.

McDANEL Industrial PORCELAINS

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

Personnel Changes

SHARPLES

Howard F. Bjork has been appointed vice-president, manufacturing; **Howard I. Cramer,** vice-president, development, and **George R. Lawson,** vice-president, sales, according to an announcement from the company. Mr. Bjork is a graduate of the University of Michigan, and has been plant manager since 1950. Dr. Cramer has been director of development since 1944 and is a graduate of Universities of Akron and Wisconsin. He is a past secretary and chairman of the Rubber Division of the American Chemical Society. Mr. Lawson has been sales manager since 1951 and is a graduate of Yale, and was a consultant in the Office of Production Research and Development during WW II.

H. F. Bjork

G. R. Lawson

H. I. Cramer

PENNSALT

Joseph S. McCulloch has been appointed manufacturer's representative the Corrosion Engineering Products department, which include chemical-proof cements, acid-proof mortars, chemical-resistant membranes and corrosion-resistant coatings. His territory will cover Maryland, Delaware, Eastern Pennsylvania and Southern New Jersey.

GENERAL ELECTRIC

Leonard J. Sacks has been appointed supervisor of customer service for the Chemicals Materials Department in Schenectady, according to an announcement from the company. For the past three years he was sales representative for alkyd resin products in metropolitan New York area.

PENNSYLVANIA INDUSTRIAL

Lester J. Wolfe has been appointed Chicago District Sales Manager of Pennsylvania Industrial Chemical Corporation, according to an announcement from the company. Prior to joining PICCO as a sales executive in August, 1953, he was assistant manager of sales of General Chemical Division, Allied Chemical & Dye Corporation. He also has served as director of sales for Man-Gill Chemical Company, of Cleveland, Ohio. Mr. Wolfe is a graduate of Allegheny College, with a B.S. degree in chemistry.

L. J. Wolfe

DEVOE & RAYNOLDS

A. R. O'Neal has been appointed Assistant Vice-President, according to an announcement from W. C. Dabney, President. In his new post Mr. O'Neal will devote himself to industrial maintenance coating sales. Previously Mr. O'Neal served as eastern manager of the Industrial Maintenance Division earlier as eastern district manager of trade sales. He joined the company in 1949, coming from the Linde Air Products Co. Division of Union Carbide & Carbon Corporation, New York.

A. R. O'Neal

Which of these
CARBON BLACKS
meet your tinting and coloring needs?

FURNACE

***Witcoblak® F-1**	**Most economical. Largest particle size, lowest oil absorption, bluest undertone. Easy dispersion.**
***Witcoblak F-2**	**Slightly darker color than F-1.**
***Witcoblak F-3**	**Jetter masstone. High tinting strength, good blue tone.**

CHANNEL

Witcoblak No. 11	**Very dense semi-pelletized channel black. Less dusting.**
***Witcoblak No. 32**	**Maximum jetness available at low cost.**
***Witcoblak No. 50**	**Standard low-cost black. Provides ideal combination of color, flow, tinting strength.**
***Witcoblak No. 100**	**Darker grade of channel black than low-price range.**
Witcoblak Hitone	**Next jetter grade for industrial enamels and lacquers.**

Manufactured in Witco-Continental plant at Sunray, Texas.
****Available in pelletized form.***

WITCO CHEMICAL COMPANY
CONTINENTAL CARBON COMPANY
260 Madison Avenue, New York 16, N.Y.
LOS ANGELES · BOSTON · CHICAGO · HOUSTON · CLEVELAND · AKRON
SAN FRANCISCO · AMARILLO · LONDON AND MANCHESTER, ENGLAND

"Putting the finger on" a paint's ability to be self-cleaning, yet preserve film integrity. National Lead's Sayville Test Station, Sayville, L.I.

At your finger-tips...proof

that Dutch Boy Basic Silicate White Lead* **"45X"**

has what it takes to make foolproof exterior paints

"Lead" is a wonder worker.

And the type of "lead" that works wonders in exterior paints most economically is "Dutch Boy" Basic Silicate White Lead "45X."

The experience of many leading paint makers proves this. So do tests at National Lead's Sayville Exposure Station, where many different pigments have been exposed for years.

One of these tests "puts the finger on" a paint's ability to be self-cleaning, yet preserve film integrity. This places right at your finger-tips proof that "Dutch Boy" Basic Silicate White Lead "45X" gives you the precise control or balance needed in white House Paints.

"45X" does more than that for exterior paints — much more, other Sayville tests show.

In tinted House Paints, it increases film durability and resistance to color changes.

In Primers, "45X" contributes greater adhesion, plus the water resistance to maintain the paint film's adhesive bond.

In Porch and Floor Enamels, it plasticizes the film, increases abrasion resistance, improves adhesion.

In addition to its adaptability, "45X" is "lead" in its most economical form. You actually use fewer pounds than with other white lead types. That's because the reactive portion of each "45X" pigment particle is concentrated at the surface and, thus, proportionately larger amounts of "lead" are made available.

Cut complaints on your exterior paints. Use economical "Dutch Boy" Basic Silicate White Lead "45X."

National Lead Company: New York 6; Atlanta; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.). In Canada: Canadian Titanium Pigments Ltd., 630 Dorchester Street, W., Montreal.

*Reg. U. S. Pat. Off.

A. I. Pruett

W. J. Timberman, Jr.

PPG

A. **I. Pruett** has been appointed divisional manager of the Newark, N. J. paint factory, and **William J. Timberman, Jr.,** has been made divisional manager of the Thresher paint and varnish division, Dayton, Ohio, according to an announcement from the company. Mr. Pruett was for six years divisional manager of the Thresher plant, while Mr. Timberman was associated with the Newark plant since 1940. **William T. Carey** was named director of sales, petroleum and transportation finishes, and **John A. Burke, Jr.** becomes assistant director.

UNITED CARBON

Dr. A. J. Susie has joined the technical staff, according to an announcement from the company. He was previously senior scientist with the Armour Research Institute, Chicago. He is a graduate of Ohio Northern University and received his master's degree in chemistry at Toledo University in 1936, his Ph.D. from Purdue in 1939. Dr. Susie is the holder of several patents and author of numerous scientific papers. He is a member of the Rubber Division, American Chemical Society, and the Chicago Rubber Group. He assumed his duties in the home office of the company at Charleston, W. Va. a short time ago.

A. J. Susie

AMERICAN CYANAMID

Erhart K. Drechsel has joined the market research department, according to an announcement from the company. He previously specialized in the polymer and resin field, and was graduated from Drew University, and received his Master's degree in Organic Chemistry from Syracuse University.

Dr. T. M. Vail has joined the new product development department, the company announces. He was formerly with the industrial chemicals division as field representative.

HOOKER

Richard W. Dunlap has been appointed paint representative for western Iowa and Nebraska territory, according to an announcement from the company.

Vernon Hare, who formerly serviced the territory will now represent the company in South Dakota and Minnesota. Both men will have headquarters in the firm's Sioux City branch office.

Harris C. Hiller has been appointed assistant district sales manager of New York district sales office of Hooker Electrochemical Co. **Dr. Frank W. Long** has been transferred from the research and development department to the sales development group of the sales department.

DIAMOND ALKALI

C. A. Butler, Jr. has been appointed Director of Commercial Development and **Loren Scoville** has been named to take over Mr. Butler's position as Director of Engineering, according to an announcement from Raymond F. Evans, president. The following were appointed to the newly formed Chlorinated Products Division, by C. E. Lyon, vice-president of the division: **Dr. D. J. Porter,** as assistant general manager and divisional research director; **Dr. J. J. Lukes,** research manager; **W. B. Beeson, Jr.,** product sales manager; **W. J. Esselstyn,** solvents sales manager; **M. T. Walsh,** sales manager of Chlorowax and related products; **D. C. Nevling,** divisional administrative assistant.

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PAINT A	30	0	15
" B	30	17	15
" C	30	16	16
" D	30	0	24
" E	31	17	19
" F	34	11	17
" G	35	0	24
Fed. Spec. TT-P-103	38	0	19

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HORSE HEAD PRODUCTS

GOODYEAR

. E. Workman has been named as stant to the general manager, the company announces, in which position he will assist in the coordination of the research, development, production and sales phases of the chemical operation. **C. O. McNeer** has been appointed general sales manager, and **M. J. Rhoad** has been promoted to assistant to the general sales manager.

R. E. Workman

M. J. Rhoad

C. O. McNeer

All appointments were announced by H. R. Thies, general manager of the Chemical Division. Mr. Workman has had ten years experience in chemical research, sales and commercial development and is widely known on the paint and plastics industries. Mr. McNeer has ten years experience in chemical research, sales and commercial development; Mr. Rhoad is a synthetic rubber technologist.

CROWN

Dr. **Edward M. Redding** has been appointed director of research and development of the Crown and Closure Division, according to an announcement from J. J. Nagle, president. Dr. Redding received his BS in Chemical Engineering from University of Denver, and Sc.D. from MIT. He was previously affilated with the Aerophysics Laboratory of North American Aviation Inc.; director of research of Kettering Foundation; and in like capacity for Sharples Corp. He is a member of the ACS, AICE, Ohio Academy of Science, and American Association for Advancement of Science. He will direct the scientific research and development program at Crown

E. M. Redding

GENERAL PAINT

Carroll J. Roddy has been appointed Architectural Service representative, according to an announcement from Roy B. Robinette, president. He will work with E. R. Cluff, vice-president in charge of maintenance. Mr. Roddy has wide experience in the paint business, having been a painting contractor, estimator, and salesman of technical finishes. His new appointment will ambrace the contact of architects and engineering firms in the interests of the products manufactured by the company.

C. J. Roddy

ROBERTSON COMPANY

S. G. Tyler has been appointed vice-president and director of sales, the company announces. He is a graduate of Duke University, and was connected with Dabney Company for seventeen years, the last seven of which is divisional sales manager. He will supervise the sales of industrial finishes for wood, metal, paper and foil in which the company specializes. In addition to Mr. Tyler, the present management of the firm consists of T. M. Stokes, president, and M. A. Fritz, vice-president.

S. G. Tyler

A new motion picture showing the way in which modern industrial companies are planning for profits with nitrocellulose lacquers is now available for showing. Presented by Hercules, this 17-minute color and sound movie is based on actual case histories of lacquering operations as practiced by seven of the nation's largest manufacturing concerns. Products covered are machine tools, fighter planes, school bus bodies, M48 tanks, farm equipment, furniture and pianos.

For details regarding the availability of the movie, contact your nearest Hercules' representative.

Cellulose Products Department
HERCULES POWDER COMPANY
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CL54-2

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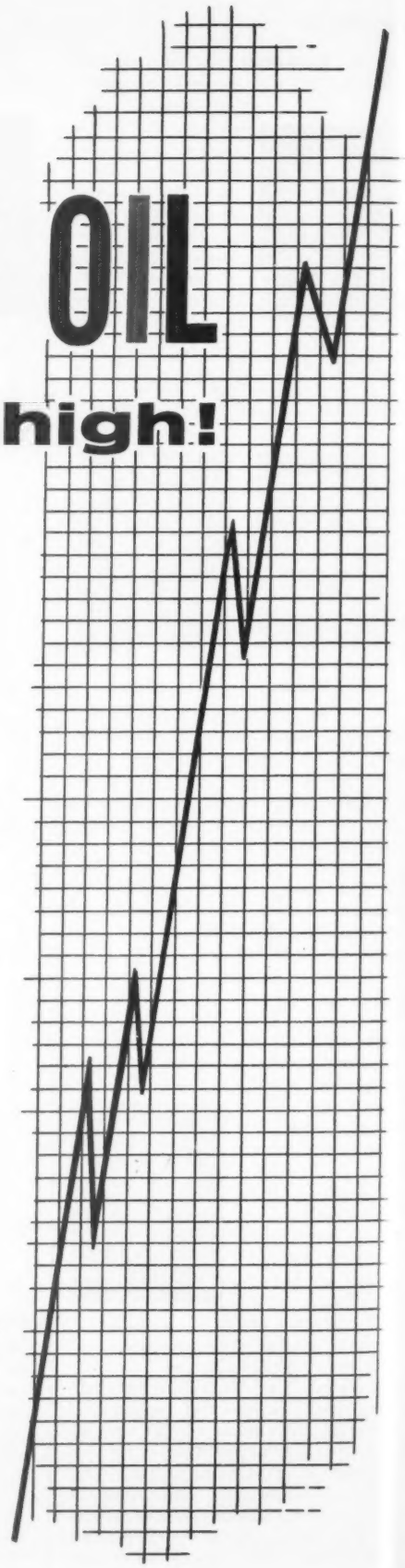

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JONES-DABNEY

R. V. Probeck has been appointed sales representative in the Detroit area, covering Michigan and northern Indiana, for the resins and chemical division. He was graduated from Purdue University and was an officer in the 1st Infantry Division in WW II. During the past six years he served in various capacities with the production department and in the laboratories. He is the son of E. J. Probeck one of the founders of the company, who also was president of the Federation of Paint & Varnish Production Clubs in 1929-30. E. M. Deane, who formerly covered this territory has been transferred to Cleveland.

R. V. Probeck

AMERICAN CYANAMID

Emil Hladky has been appointed manager of the titanium dioxide pigment plant now under construction near Savannah, Ga. He is a graduate chemical engineer of Columbia University, and was previously chief chemical engineer of the Southern Mineral Products Co., Piney River, Va., which was acquired by Cyanamid in 1944. In 1952 he was appointed manager of the company's ultramarine blue plant in Newark, N. J. He is a member of the American Institute of Chemical Engineers, American Chemical Society, American Institute of Mining and Metallurgical Engineers, and the Chemist's Club of New York.

Emil Hladky

BORDEN

William R. Moffitt has been appointed vice-president and technical director of the chemical division of Borden Company, New York. He was formerly manager of west coast operations, and has spent his entire business career with the chemical division.

ATLAS POWDER

Dixon C. Van Winkle has been named manager of the New York district sales office of the chemical department. He joined the company in 1952 as special sales assistant.

AMERICAN MINERAL

Thomas Barker has been transferred to the company's main office in Chicago, it was announced by M. A. Williams, vice-president and sales manager. He was previously manager of the mid-south territory with offices in Jackson, Miss. Robert L. Moore, Jr. succeeds him in the mid-south territory. Mr. Barker has had a number of years experience in the petroleum industry, and is a graduate of Miami University with a BS in chemistry. He served as a navigator in the Air Force in WW II.

Thomas Barker

BARRETT

Cass Cislo has been appointed Assistant Sales Manager in charge of sales for phthalic anhydride, maleic anhydride and fumaric acid. **R. S. Hunicke** has been appointed Assistant Sales Manager in charge of sales of aromatic solvents, acetone, glycols and crude distillates. **A. D. Ce Meurisse** has been appointed Assistant Sales Manager in charge of phenols and other tar acids, tar bases and niacin. **J. E. Shand** has been appointed Assistant Sales Manager in charge of plasticizers, "Cumar" resin, naphthalene and rubber compounding materials.

John W. Hagins has been appointed chemical sales representative for New England, comprising Maine, New Hampshire, Vermont, Rhode Island and eastern Massachusetts. He formerly was located in Minneapolis.

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At last! Now you can make exterior house paints with the outstanding durability of alkyd resins, *plus* greatly increased resistance to moisture-blistering and metal-staining.

New AROPLAZ 1400 is the result of seven years of laboratory work and field testing. These tests show that paints made with AROPLAZ 1400 have better gloss retention, better wearing properties, and better over-all appearance throughout their long life . . . and brushing properties are excellent.

This new U.S.I. *"first"* gives best results as the sole vehicle for house paint formulations. However, it can also be partially modified with oil if desired. Known experimentally as resin DX-159, AROPLAZ 1400 is in commercial production. It is supplied at 100% solids content.

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Basic Materials Exposition Scheduled, May 17-20 in Chicago

Hundreds of new uses of materials for products manufactured by the nation's industrial plants will be considered and discussed at the second Basic Materials Conference, to be held at the International Amphitheatre, Chicago, concurrently with the Basic Materials Exposition, May 17-20.

Displays and conferences will cover not only materials which improve the utility or sales value of capital and consumer goods but also those materials which reduce production costs. Discussions will range from late developments in solving such problems as corrosion and methods of joining materials to forecasts of materials likely to be used by industry in the next ten years.

One of the highlights of the program will be a study of materials currently being developed for manufacturing rockets and guided missiles to determine how such materials can be used for the whole range of peacetime products.

With the principal emphasis on development of new products, the show and conference are expected to attract more than 10,000 product designers, project engineers, production experts, research men, sales and marketing executives, as well as top management.

Seventeen outstanding specialists will address the sessions. T. C. Du Mond, editor, "Materials & Methods," will serve as general chairman and open the meeting with a review of new developments in engineering materials. Carsen E. Hawk, who heads the development department of the liquid engine division, Aerojet-General Corp., will deliver the paper on peacetime uses of materials developed for rockets and guided missles. It is titled, "Rockets and Guided Missles—How New Materials for Weapons Can Help Industry."

Other major topics include new metal forming processes, and uses of non-metallic materials. One session will be devoted exclusively to advising companies how to establish a materials department, with particular emphasis on gathering information about new materials and how to use the data within a company.

Exhibits will range from new uses of such conventional materials as wood and glass to displays showing new uses of ceramics, recently developed plastics, new metals such as titanium and zirconium, as well as new materials for plating and surfacing, and bonding and joining.

•

Canadian Chemical Exhibition Scheduled June 21-23 in Toronto

The very latest in chemical process equipment, scientific instruments, chemicals, and scientific books will be displayed by nearly 50 companies at the Chemical Exhibition to be held by The Chemical Institute of Canada at the Royal York Hotel in Toronto, June 21, 22 and 23. This Exhibition is the only one of its kind in Canada, and forms a significant part of the Institute's 37th Annual Conference being held at the same time and place.

A glass chemical plant will be among the many interesting features of the exhibitors of chemical process equipment. Other new items in this group will include: heating equipment, process instruments, vacuum dryers, kettles, gas chambers, fluid mixers, and corrosion resistant equipment.

A demonstration of a new method of analysis of brass will be among one of a great number of exhibits dealing with scientific equipment and supplies. Others will include the latest developments in filter papers, colorimeters, spectrographs, microscopes, laboratory furniture, and other instruments.

Process and laboratory chemicals to be on display will include: vegetable oils, surface active agents, activated carbon, synthetic organic chemicals, fatty acids, and many others.

Upwards of 1200 delegates are expected to attend this Conference and Exhibition.

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Resins
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R-16-A
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R-16-A, LX 685 and LX 782—hydrocarbon resins—provide excellent water and salt spray resistance for pipe coatings.
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Hercules to Boost Production of Chlorinated Rubber at Parlin Plant

A fifty per cent expansion in the production facilities for Parlon, chlorinated rubber, was announced by Hercules Powder Company. Construction on the new unit will begin immediately at the company's plant in Parlin, New Jersey.

Expansion of production facilities is being undertaken to meet rapidly increasing demands for chlorinated rubber base finishes for a wide variety of industrial, maintenance, traffic, and masonry applications such as the station ceilings of Toronto's new $50,000,000 subway.

•

Pierre S. Du Pont, Noted Industrialist, Succumbs

Pierre Samuel du Pont, industrialist, philanthropist and head of the du Pont family, died unexpectedly on April 5th. He was 84 years old.

He was stricken at his home, near Kennett Square, Pa., about 7 p.m., and died three hours later.

Only recently, Mr. du Pont, with his nephews and nieces and members of his own generation beaming approval, was made a commander of the Legion of Honor of France. He had been a chevalier since soon after World War I in recognition of the company's contributions to the Allied cause and later was honored with the rank of officer.

Pierre S. du Pont acquired E. I. du Pont de Nemours & Co., at the turn of the century with his two cousins, Alfred I. and T. Coleman du Pont. They began the transformation of the company, already 100 years old, from a maker of black powder to the greatest chemical enterprise in the world. Pierre du Pont was a director and honorary chairman of the board of the company at his death.

•

Dept. of Agriculture Prepares Drying Oil Report for Industry

The Agricultural Marketing Service is making a study of what drying oils are used for particular purposes by industry, the factors that determine whether a particular oil will be used, and desirable properties of the oils for each purpose. Similar information is being obtained for various synthetic products such as synthetic resins, rubber and water-base paints. A report will be available to industry as soon as this study is completed.

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Compare your method with the efficiency of these Armour fatty acids —then select the most suitable

For large volume processing where color retention is not essential, you can produce harder, tougher finishes and save money with Neo-Fat 130. This dependable, quality-controlled, unsaturated fatty acid is specially made to fill a gap in the alkyd raw material market, giving you an extremely low-priced yet consistent alkyd chemical for quantity production. (Titer . . . 28°C. Max.,—Iodine Value . . . 125 Min.—Acid Value . . . 195 Min.—Color Max. . . . 4 Gardner.)

For heat and color stability in high-grade alkyd finishes, Armour Chemical Division provides you with low-cost Neo-Fat 125—the fatty acid that makes whites *stay* white! Extensive color, processing, and drying time tests insure the double stability of Neo-Fat 125 that means better alkyds for you. (Titer . . . 25°C.,—Iodine Value . . . 124 Min.—Acid Value . . . 196-202—Color Max. . . . 4 Gardner.)

For faster processing and brilliant color in your finishes, use the top chemical in the alkyd market—Neo-Fat 140! A titer of only 5°C. keeps it from solidifying until just above freezing. And note the high iodine value and low saturated fatty acid content—they mean more double bonds, giving you faster drying, harder finishes. (Titer Max. . . . 5°C.,—Iodine Value . . . 140-143—Acid Value . . . 197-202—Color Max. . . . 2 Gardner.)

Write to the address below for free samples and prices of these top chemicals. Test the Armour samples and compare efficiency, results, and cost with your present method. We believe you'll choose Armour fatty acids to improve your alkyd production.

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- Extenders for Chlorinated rubber.
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- Non-saponifiable.
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Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

Aqueous Polymerization of Vinyl Derivatives

U. S. Patent 2,673,192. Archie Hill, Painesville, Ohio, assignor to Diamond Alkali Company, Cleveland, Ohio, a corporation of Delaware.

The method of polymerizing mono-ethylenically-unsaturated, polymerizable, organic compounds of the class having a terminal ethylenic double bond, which includes the steps of dispersing 1 part by weight of a material of said class in not more than 4 parts by weight of an aqueous acidic medium including a mixture of water, sulfite ions, and chlorate ions, said sulfite ions being in excess of the equivalent molecular proportion of said chlorate ions, maintaining the pH of said medium substantially within the range of 2-6.5 during the polymerization reaction, and recovering a homopolymer of said class from said medium.

Liquefaction of Silicone Rubber Gum

U. S. Patent 2,673,843. Bingham J. Humphrey, Mount Carmel, and Harry H. Wasserman, Hamden, Conn., assignors to The Connecticut Hard Rubber Company, New Haven, Conn., a corporation of Connecticut.

The method which includes the steps of partially depolymerizing a solid polydimethylsiloxane elastomer to form a viscous liquid, filtering the material while in the liquid state to remove non-siloxane solids present in the elastomer, and repolymerizing the material to form a modified solid polydimethylsiloxane, said depolymerization being accomplished by subjecting the solid elastomer at approximately room temperature to an essentially anhydrous acid chosen from the class consisting of hydrochloric acid, hydrobromic acid, hydriodic acid, thionyl chloride, acetyl chloride, benzoyl chloride and phthalyl chloride.

Enamel With Stabilized Drying Rate

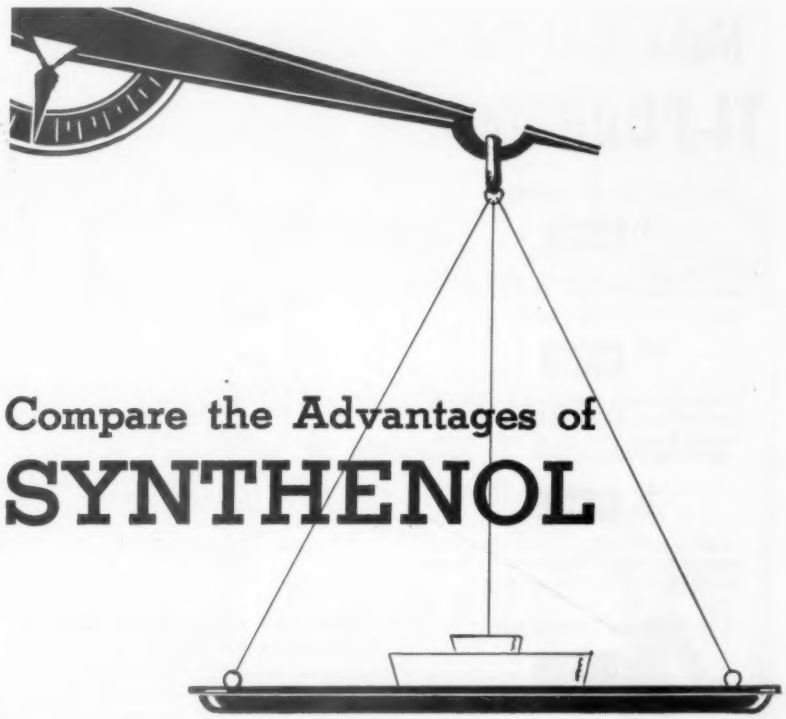
U. S. Patent 2,669,526. Donald F Koenecke, Elizabeth, and John F. McKay, Jr., Cranford, N. J., assignors to Standard Oil Development Company, a corporation of Delaware.

A coating composition comprising 100 parts of an oily siccative diolefin polymer prepared by the polymerization of conjugated diolefins having from 4 to 6 carbon atoms in the presence of a catalyst chosen from the class consisting of hydrocarbon soluble peroxides and metallic sodium having a molecular weight between 1,000 and 10,000 in solution in a hydrocarbon solvent boiling between about 60 and 250° C., 5 to 300 parts of a finely divided pigment dispersed therein, a small amount of at least one heavy metal soap drier, and about 2.5 to 10 percent of powdered calcium oxide based on the weight of diolefin polymer.

High Viscosity Polyvinyl Alcohol

U. S. Patent 2,668,809. Harold W. Bryant, Kenmore, N. Y., and William R. Cornthwaite, Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware.

A process for the production of polyvinyl alcohol which comprises polymerizing vinyl acetate in the presence of a terminally unsaturated mono-olefin containing 12 to 18 carbon atoms the amount of said mono-olefin being equal to 0.01 to 10% of the weight of said vinyl acetate and the amount of any vinyl acetate solvent present during



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DEHYDRATED CASTOR OIL,
ALWAYS PROVEN IN PERFORMANCE,
IS NOW FREELY AVAILABLE AND
ATTRACTIVE IN PRICE AT THE MARKET

polymerization varying from zero to 30% by weight of the vinyl acetate and saponifying the resulting polyvinyl acetate until at least about 75% of the acetate groups have been converted to hydroxyl.

Bodying Catalysts For Drying Oils

U. S. Patent 2,669,573. Earl E. Parker, Milwaukee, Wis., assignor to Pittsburgh Plate Glass Company, Allegheny County, Pa., a corporation of Pennsylvania.

A process of treating a drying glyceride oil which comprises heating the oil to bodying temperature in the presence of .05 to 3% of a catalyst consisting essentially of 9-anthrone until a desired increase of viscosity is attained.

Heat Treatment Process of Hydrocarbon Drying Oils

U. S. Patent 2,672,425. Anthony H. Gleason, Westfield, and Robert F. Leary, Cranford, N. J., assignors to Standard Oil Development Company, a corporation of Delaware.

A process for preparing a drying oil which comprises copolymerizing a mixture of from 75 to 85% of butadiene and 25 to 15% of styrene in 200 to 300 parts of a hydrocarbon diluent per 100 parts of monomers and 20 to 30 parts of a member of the group consisting of aliphatic ethers of 4 to 8 carbon atoms and cyclic diethers of 4 to 8 carbon atoms, in the presence of 0.5 to 5 parts of finely divided sodium at a temperature between 40 and 85° C., continuing the polymerization until substantially 100% conversion is obtained where a product is obtained which has a viscosity somewhat less than that ultimately desired, killing and removing the catalyst and then heating the product in the absence of air at a temperature between 175 and 275° C. until a drying oil having the desired viscosity is obtained.

Tank Lining

U. S. Patent 2,673,817. Arthur F. Burns, Jr., Riverside, Calif., assignor to Hart and Burns, Incorporated, Riverside, Calif., a corporation of Texas.

In a method of protecting metallic objects from corrosion, the steps of applying to the surface to be protected a coating composed essentially of an aqueous solution of alkali silicate and finely divided metallic zinc, the zinc constituting between about 75% and 96% of the mixture on a dry basis, and treating said coating with a dilute aqueous saline solution having a pH of between 4 and 8.5 to produce a complex zinc-alkalisilicate in situ.

Phenolic Composition

U. S. Patent 2,673,190. Karl Dietz, Kronberg (Taunus), Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius und Bruning, Frankfurt am Main Hochst, Germany, a company of Germany.

A composition capable of hardening rapidly in the cold to yield chemically resistant masses, comprising an inert filler, a hardening agent, a still liquid resin obtained by condensing formaldehyde and phenol in the molecular proportion ranging from about 1:1 to about 1.8:1 in an alkaline medium; a compound selected from the group consisting of diethyl sulfate, dipropyl sulfate, dibenzyl sulfate, triethyl phosphate, 1,3-dichloropropanol, epichlorhydrin, dichlorhydrin, ethylene chlorohydrin, said compound being present in an amount ranging from about 5 per cent. to about 25 per cent., calculated upon the amount of the resin used; and furfurol in an amount ranging from about 10 per cent to about 90 per cent., calculated upon the amount of the resin used.

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* **R-110**

A high-opacity pigment that resists after-yellowing. Used in industrial finishes and baked coatings.

* **R-510**

Known for ease of dispersion. Used in architectural finishes and exterior enamels where maximum chalk resistance is not desired.

* **R-610**

Highly resistant to chalking. Used mostly in exterior finishes . . . tinted enamels . . . tinted house paints.

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* **FF**

Free-chalking pigment (medium oil absorption). Widely used in self-cleaning white house paints.

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"Semi-chalking" pigment used in outside house paints to control rate of chalking.

* **LO**

Low-oil-absorption pigment for easy production of interior finishes. Has excellent color and gloss.

* **LO-CR**

Superior to LO in color retention. Used for industrial finishes and baked white coatings where blue-whiteness is needed.

YOUR DU PONT SALES-SERVICE REPRESENTATIVE will gladly give you complete information and help you select the "Ti-Pure" titanium dioxide pigments you need. For further information, call our nearest office or write: E. I. du Pont de Nemours & Co. (Inc.), Pigments Department, Wilmington 98, Delaware.

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PRODUCTION CLUBS

(*From page 34*)

recent publication of their latest books:

Henry F. Payne—Organic Coating Technology.

George S. Cook—Review of the Paint Industry for 1953.

The committee was advised that Si Mountsier, chairman of the Advisory Committee was unable to attend as a result of an attack of appendicitis, which occurred in Texas during a business trip.

All sub-committee chairmen received complete membership lists of all the sub-committees. This information will aid the chairmen in preventing meeting conflicts, inasmuch as a number of men are members of more than one sub-committee.

Julius E. Spector reported on the activities of his committee studying "Emulsion Paints." The group is studying the use of Maronite board as a sub-strate on which they will test an alkyd modified and a polyvinyl acetate paint as primers. In both cases an unmodified commercial latex paint will be used as a top coat. Wash tests then will run after air drying 10 and 28 days.

Raymond L. Whitney reported that his committee on "Pigment Dispersion" is working on the dispersion of Toluidine Red in low vehicle solids pebble mill grinds and is correlating these results with their data on roller mill grinds.

Sidney B. Levinson advised that the committee studying "Interior Sub-Strates and their Preparation for Painting" has encountered considerable difficulty in developing a duplicable method for testing Spackle. A simple test has been worked out, but the technique of application of the Spackle is too critical to make the test valid for use by anyone but an expert. As a result of the ensuing discussion, a unique method of application of the Spackle by roller, which ensures uniformity without any particular skill, will be tried out by the committee.

S. Leonard Davidson reported that his committee on "Matching Color in Production" has tried out the Binney & Smith color lighting system. Also, the members of the group will take the Color Aptitude test in the near future.

Royal A. Brown advised that the committee set up to study the "Effect of Ultraviolet on the Properties of Lacquer Films" still is in the process of formation and could use a few more men.

George S. Cook reported that the newly formed committee on "Literature and Discussion" has initiated two projects:

1. To review the literature with the object of selecting two subjects a year for discussion by the Technical Committee.

2. To list current articles and their references that would be of interest to the members of the Technical Committee. These lists would be taken from magazines usually not read by the majority of the members and would be distributed to them monthly.

Los Angeles

The regular meeting of the Los Angeles Paint and Varnish Production Club was held Wednesday evening, March 10, 1954 at Scully's Restaurant. One hundred and thirty five members and guests were present.

The meeting was called to order by President Venatta at 8:15 P.M. Following the introduction of guests the President called upon Earl Hanson, Chairman of the Good Fellowship Committee, who reported that Al Scotland of Tibbetts Westerfield Company had undergone an abdominal operation and was at home recuperating. He hopes to return to work in about a week or so.

Wilbur Johnson, Chairman of the Spring Frolic Committee, reported that Tiny Anderson and he had well nigh completed final arrangements for the function. A good day of golf capped by an excellent dinner and floorshow in the evening would more than justify the attendance of all.

President Venatta announced that the Chairman of our Constitution and By-Laws Committee, Dick Savage, was leaving for Manila to take up his

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TROYKYD LEVEL-AID—
Eliminates brushmarks, improves Gloss, Sheen and Stain-Removal
TROYKYD ANTI-MILDEW—AND ANTI-MILDEW SPECIAL—
Phenyl Mercury Naphthenate and Oleate — plus Mercury — Best and most concentrated mildewcides
TROYKYD BODYING AGENT 21 BA—
The universal bodying and puffing agent that will have minimum effect on other properties
TROYKYD BODYING AGENT GT—
Designed specifically for paints based on Titanium calcium pigments. Eases brushing, improves viscosity, lowers cost, etc.
TROYKYD ANTI-FLOAT—
Act on BOTH surface tension and colloidal dispersion to give maximum and more permanent anti-floating and anti-silking properties.
TROYKYD ANTI-SETTLE—
Not a soap. More effective as a non-settling agent—and will not affect your film properties.
TROYKYD ANTI-SETTLE SPECIAL—
Most powerful anti-settling agent. Will stop severe cases of settling.
TROYKYD ANTI-SAG—
Will stop sagging WITHOUT affecting other properties. Enables formulation of lowest cost paints.
TROYKYD ANTI-SKIN—
Will stop skinning without affecting dry time. Very mild odor.
TROYKYD ANTI-SKIN SPECIAL—
May be added to hot varnishes without loss of agent.
DR. TROY ADVISES HELEN OF TROY
KEEP your
Rx PIGMENTS UP!
in excellent Suspension
with
TROYKYD
ANTI-SETTLE SPECIAL
A "stearated" form of processed clay. The MOST POWERFUL Anti-Settling Agent.
1. Has MAXIMUM effect on anti-settling properties—According to our tests, this new form of anti-settling agent combines the well known anti-settling properties of Aluminum Stearate and of chemically processed clay, to give a product that is more effective than either.
2. Has minimum effect on paint properties—such as gloss, viscosity, dry, resistance, etc.
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duties for National Lead Company. He intended to stay for three years. The President called upon Dick for a few words of farewell.

Dick Savage thanked all members of Los Angeles Club for the continued friendship and loyalty extended to him during his association with them. He would most certainly miss the good fellowship of our club.

Following the intermission and the award of door prizes Vern Barrett, Vice President, introduced the speaker of the evening, Mr. Augie Hempel of Monsanto Chemical Company.

Mr. Hempel discussed in technical detail the formulation of alkyds stressing the short oil type.

The alkyd, despite the fact that it is common in usage, has had its formulations guarded with secrecy. His presentation attempts to establish several fundamental rules for resin formulation and the suggestion of best techniques for processing.

For diffusion processing of alkyds it has been established in the Dow Laboratory that the following rations of alcohol to phthalic anhydride are applicable.

2.4 mols glycerin react with 3 mols phthalic anhydride.

1.2 mols of pentaerythritol react with 2 mols of phthalic anhydride.

However as oil lengths of alkyds decrease, larger quantities of excess glycerin are required to reduce the acid number below 10. Higher ratios of excess glycerin to phthalic anhydride may yield lower acid numbers but have serious effects on the properties of films such as slow drying, inferior water and caustic resistance and poorer durability.

Mr. Hempel suggested the use of a mono basic acid instead of excess of glycerin in short oil alkyd formulation. The use of Benthal, Monsanto's benzoic acid, together with varying amounts of glycerine was reviewed by Mr. Hempel. He showed the superiority of the various combinations with Benthal as a viscosity control agent as well as the lowered acid number.

He also mentioned as a viscosity agent, besides the excess glycerin and Benthal, ethylene glycol. After evaluating the films from the resins made with excess glycerin, ethylene glycol, and Benthal as viscosity control agents the Benthal was rated as being superior to the others, not only from the processing view point but also from the superior properties of both water resistance and durability obtained from its films.

Chats about Finishes

DECORATOR COLORS
FOR CHEMICAL PLANTS

by

FRED K. SHANKWEILER

Manager of Hercules'
Chlorinated Products Sales

Paints based on Parlon® (chlorinated rubber) are proving that protective coatings need not be dull and drab to be effective. Even in tough industrial environments, Parlon coatings *stay* on, light and bright, resisting attacks of acids and alkalies either underneath or on the paint film.

A good example is the attractive, immaculately kept plant of the R. K. Laros Company, Bethlehem, Pennsylvania. Here synthetic blood plasma is produced from sugar in a unique new process. Finished with a Parlon-based paint* from ceiling to floor in custom-mixed colors, the plant looks like new after over two years' exposure to alcohol and hydrochloric acid fumes.

Today, protection is as important as ever, but at the same time color is becoming more and more of a factor in the selection of a finish. There's no better combination of the two —for tough jobs—than Parlon.

**Barreled Sunlight's A & A Parlon Paint*

Fred K. Shankweiler

Cellulose Products Department
HERCULES POWDER COMPANY
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Northwestern

The April meeting was called to order by President Jacob Skala at 8:00 P.M. with 57 members and guests present. The minutes of the March meeting were approved as read. The Chairman of the Program Committee, E. P. Stark, announced that "Wash Primers and New Developments in Phenolic Coatings" would be presented by the Bakelite Company at our May meeting.

The Chairman of the Membership Committee, L. O. Spilde, gave a resume of the various local and national activities of James Kortum, after which George Haugh moved and Ed Erickson seconded, that he be proposed for Federation Honorary membership; a unanimous vote, by secret ballot of class A members, was returned. The club then voted upon the application of Earl Wookey, and elected him to membership.

Ed Erickson declared that our recent poll of the member companies showed more than enough favorable interest in the Color Aptitude Test. The order in which the test is to be rented out, will be determined by a drawing of names.

After a brief recess, the Program Chairman, Elmer Stark, introduced Mr. Elias Singer, Technical Director of the Troy Chemical Company, who spoke on "Additives—A Tool in the Formulation of Organic Finishes". Mr. Singer defined additives as an item which, used in small quantities, gives one or more desirable properties. He further stated that additives form an integral part of the formulation and should not be used only as a last resort in correcting a faulty batch of paint.

Through the use of slides, Mr. Singer showed that any top quality formulation, having some inherent defect, need not be reformulated, but by simply adding the right combination of additives, can be made to perform better, often at reduced cost. He then reviewed the problem of mildew and told how it can be eliminated, through proper

for mulation. However, such a paint might possibly fail in many other ways. His conclusion was that the safest way is to add an active anti-mildew agent, such as phenyl mercury oleate.

P. J. Whiteway Elias Singer

Philadelphia

A new secretary, treasurer, and assistant treasurer were elected into office at the March 17th meeting of the Philadelphia Paint and Varnish Production Club, held at the Engineers' Club.

David Nivin, former treasurer, was advanced to secretary; E. G. Fleming, formerly assistant treasurer, was named treasurer; and J. P. Snyder was elected assistant treasurer. Walter Bayer was selected to take Mr. Snyder's place on the executive committee. These vacancies were created by the resignation of the former secretary, John Davis, who has moved to Tennessee.

The speaker of the evening was Elias Singer, technical director of the Troy Chemical Co. He presented a paper entitled, "Additives—A Tool in the Formulation of Organic Finishes."

President P. J. Whiteway, Jr. opened the meeting by introducing two old friends, Gus Wescott and Sid Werthan, to the 119 members and guests present. The President commented on the successful Ladies' Night held in February and thanked Herman Zimmerman for making all the arrangements. Frank McNerney was thanked, too, for handling the Club-sponsored program at the Safety Council Meeting.

The National Paint, Varnish and Lacquer Association's brochure, "Your Brightest Tomorrow Is in the Paint, Varnish and Lacquer Industry," was explained and displayed by John Harner. This literature is designed to attract the youth of American into the paint industry and Mr. Harner stated that it may be obtained from Association Headquarters at 20c per copy.

The Annual June Outing will be held at the Plymouth Country Club on Thursday, June 10. Vice-President McNerney announced that Ralph Frazier will again be host. Greens fee will be $5.00. Steak dinners will be served.

Louisville

The March 17th meeting was held at the Seelbach Hotel, 59 members and guests attending.

Harod Klassen of the Educational Committee reported on the data assembled.

Charles Smith of the Technical Committee reported on the status of subject for selection.

Thomas Richie as vice-president pro tem introduced guest speaker Mr. C. O. Schwahn of the Bakelite Company who developed and illustrated his subject "Recent Developments in Coating Resins."

Chicago

Polyvinyl Acetate Paints was discussed at the April 5th meeting by Mr. H. J. Zahrndt, manager of the paint section, National Starch Products, Inc. He formerly worked in the New Products Development section of the Research Department on the evaluation and application of polyvinyl acetate resins, PVAc paints, and new starch derivatives. Mr. Zahrndt is now actively engaged in laboratory and field development of paint formulations based on polyvinyl acetate emulsions and new polyvinyl acetate copolymers.

The following subjects were discussed: Introduction—PVAcs in general, not specific products; European PVAc Paints—weathering data, formulations; Advantages of PVAc paints; Typical formulations and method of manufacture; PVAc emulsions, both straight and internally plasticized, film formation, film properties, MVTR, particle charge, odor, etc; Other formula ingredients: pigments, extenders, thick-

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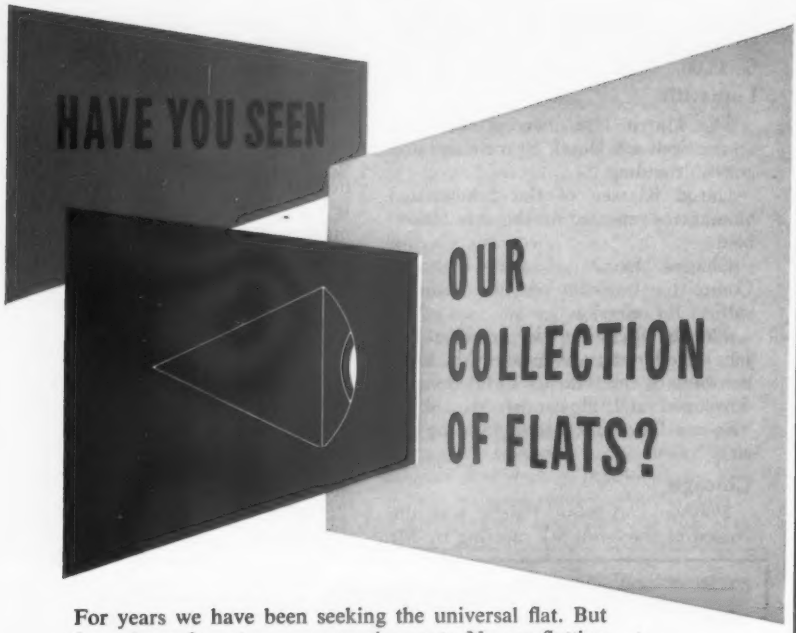

For years we have been seeking the universal flat. But formulators have too many requirements. No one flatting pigment can meet all of them.

So we carry on a continuing study of new and old flatting pigments . . . and make a few of our own to meet special needs. They are pre-dispersed for optimum performance.

Tell us about your flatting problem. We may be able to help.

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Pigment dispersions in nitrocellulose; ethyl cellulose; urea formaldehyde, vinyl and alkyd resins; chlorinated rubber and other plastic binders.

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MICA FOR LATEX PAINTS

WATERGROUND AND MICRO

Waterground Mica and Micro Mica make a well knit durable film . . . reduce penetration, running, and sagging . . . improve adhesion and bridging.

The English Mica Co.

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eners, wetting agents, defoamers, freeze-thaw agents, wet-edge promoters; Can stability and can corrosion, corrosion inhibitors; Alkyd inclusion, reasons for, disadvantages, patent discussion; Problems of water spotting, color compatabilities, grinding of colors; and Competitive resins.

Uses of the various company products were outlined using formulation, lantern slides and panels.

Baltimore

Approximately 65 members and guests were present at the March 12, 1954, meeting of the Baltimore Club. Members of the Club were extended an invitation to attend a meeting of the American Society of Corrosion Engineers. The meeting was held on March 22nd at 6:30 P.M. at the Engineers Club. Dr. Allen Alexander of the Naval Research Lab, a member of the Baltimore Production Club, addressed the group on "Anti-Fouling Paint".

A standing welcome was given Howard Shell attending his first meeting since his illness.

The Fire Retardant Committee round table panel was highlighted by Mr. Shurts' preface of the importance and nature of latest work being done to lessen the loss of life and property from fire by the use of paint. Mark Westgate demonstrated his "wick and strick" test method of determining fire resistance of paint films. After this most enlightening and spectacular demonstration other members of the committee panel presented a brief outline of the specialized work they were doing. A general discussion followed involving questions on the material presented and on new aspects of the topic. Mr. Crippen was congratulated on his excellent work with the committee and in organizing the program.

The April Meeting was held on Friday, April 9, 1954, with 130 members and guests in attendance.

The past presidents of the Association introduced by A. A. Shuger were Jim Whitescarver, Art Franklin, Frank Warner, Burch Athey, Herman Shuger, Art Smith, Bill McGill, Stan Levy and Frank Connaly of the New York Association.

Past Presidents of the Production Club introduced by Len Cohan were: Ross, Shurts, Ira Wilbur, Frank Scofield, Doc Eisenberg, Ralph Lamenzo, Howard Centwell, Howard Sholl, Bernie Ruben, Joe Bruning, and Tom Reece.

The guest of honor, "Farmer" Bob Bonney of Maryland who in his spare time is Vice President of Congoleum-Nairn, gave his explanation of the founding and growth of the Production Clubs—frustration. In the twenties the technicians were so lonely it was the only way they could find anyone

with whom to talk. The paint industry now has research taking places in a greater percentage of its component members than any other industry.

After a brief well chosen message by Homer Flynn, Cal Overmyer addressed the group. He dealt, in particular, with his recent attendance at the Birmingham, England, meeting he attended in March and the technical progress of the constituent clubs of the Federation. After a short intermission during which photographs of the officers were taken, two entertaining films "How To Play Golf" and "The Pep-Saddler Fight" were shown.

HIGH POLYMER

(From page 31)

Amino resins such as urea formaldehyde resins, are reacted in the presence of alcohols which form ether condensates. Alkyd resins made for use with amino resins should have residual hydroxyl groups for etherification with the alcohol groups in the methylol urea condensate. Melamine resins react similarly.

The films deposited by evaporation from solution of linear high polymers are formed by the deposition of a felt-like mass of entangled mono-dimensional macromolecules. These depend for cohesion upon the polar attractions between the groupings on neighboring chains.

We have discussed the present status of high polymer chemistry in the field of protective and decorative coatings. The science of macromolecules has progressed to the point where the properties and behavior of synthetic resinous materials may be predicted based upon their structural configurations. Much of this, it must be admitted, is "post hoc" rationalization based on prior knowledge, however, consideration of the structure of macromolecular networks encourages research along the new lines in which the future of the paint industry will be found.

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4. Schmidt, A. X. and Marlies, C. A. "Principles of High-Polymer Theory and Practice," McGraw Hill Book Co., New York

B. H. Boyet Co. Host to Eleven Paint Firms in Louisville Area

A group of 21 sales and technical executives from eleven paint concerns in the Louisville area were recently guests of B. H. Boyet & Co., local manufacturers representatives.

Following a luncheon at the Brown Hotel, host Brice Boyet introduced Walter Clark and C. J. Kaiser of Nuodex Products Co., Inc., Elizabeth, N. J., who presented "The Mildew Story", a photo-slide presentation on paint mildew and its control.

Attending the affair were: Horace Mahorney, Hardy Brinley (President Louisville Paint & Varnish Production Club), Chance Tatum, Hubert Donahew, Otto Mileti, Jr., W. D. Menefee (President Louisville Paint, Varnish & Lacquer Association), C. G. Luckett, Leo Griesbaum, Marvin Scobee, Roy Scott, Calvin Marcus, Jr., H. K. Strassel, Sr., M. H. Kleier, Arthur Stauderman, D. W. Mabrey, D. P. Boaz, William Veneman, Charles Smith, B. H. Boyet, C. J. Kaiser, Walter Clark, Gordon Brown, Mel Irvin, Ed Fisher, J. P. Helfrich.

•

Metal Cans Output At New High in 1953

Industry-wide production of metal cans reached a new all time high during 1953, according to the American Can Company.

D. B. Craver, the firm's vice president for sales, said that U. S. Department of Commerce reports on the short tons of steel consumed in the manufacture of cans during 1953 indicate a record production of more than 35,600,000,000 (b) containers, estimated on the basis of No. 2 cans.

Last year's output of metal containers for all purposes was about 2,000,000,000 (b) units more than the year before.

McCloskey's No. 10510

UNIVERSAL TINTING PASTE VEHICLE

The greatest money-saver and improvement for paint manufacturers since the discovery of titanium. Our technical staff have perfected an entirely new vehicle which is a must in every paint manufacturing plant, not only because it will save the paint manufacturer hours of labor and untold loss through waste such as skinning, hardening, etc., of tinting color, but reduces the tinting color of a manufacturer to one tinting vehicle for all types grinding mediums.

This marvelous vehicle eliminates the necessity of grinding tinting colors in different vehicles to meet the demand of each particular product. Frankly, you cannot afford to be without McCloskey's No. 10510.

Imagine . . .

ONE TINTING PASTE FOR—

STYRENATED ALKYDS
LONG OIL ALKYDS
MEDIUM OIL ALKYDS
SHORT OIL ALKYDS
HOUSE PAINTS
LACQUERS
OLEORESINOUS VARNISH ENAMELS
UREA RESINS
CHLORINATED RUBBER
MELAMINE RESINS

100% TINTING COMPATABILITY WITH ALL OF THESE

Order a drum or a five gallon container of this material at our risk.

McCLOSKEY VARNISH CO.

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ALCOLEC

alcolec S

liquid lecithin

Tops for oil-base paints, etc.

alcolec W-14B

water dispersible lecithin
for latex paints,
pigment applications, etc.

Ask to be put on mailing list to receive Technical Bulletins. Consult our Laboratory on problems involving wetting and dispersion.

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MICA WATER-GROUND
"At Its Best"

Concord Mica most admirably suited for all Paint Formulations especially "LATEX EMULSION".
PURITY: Uniformly ground from imported Mica flake washed to remove all impurities.
COLOR: Extremely white.
AVAILABILITY: Deliveries from stock.

Send for samples and prices

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CALENDAR OF EVENTS

May 22. St. Louis-Kansas City Production Club Joint Meeting, Chase Hotel, St. Louis, Mo.

May 24. 40th Annual Convention of Nat'l. Assn. of Printing Ink Makers, Edgewater Beach Hotel, Chicago, Ill.

June 13-18. ASTM Annual Meeting. Sherman and Morrison Hotels, Chicago, Ill.

June 21-23. Annual conference and exhibition of the Protective Coatings Div., Chemical Institute of Canada, Royal York Hotel, Toronto, Canada.

Production Club Meetings

Baltimore, 2nd Friday, Park Plaza Hotel.

Chicago, 1st Monday, Furniture Mart.

C.D.I.C., wnd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmillers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.

Cleveland, 3rd Friday, Harvey Restaurant.

Dallas, 2nd Thursday, No Fixed Place.

Detroit, 4th Tuesday, Rackham Building.

Golden Gate, Last Monday, E. Jardin Restaurant, San Francisco.

Houston, 2nd Tuesday, Seven Seas Restaurant.

Kansas City, 2nd Wednesday, Pickwick Hotel.

Los Angeles, 2nd Wednesday, Scully's Cafe.

Louisville, 3rd Wednesday, Seelbach Hotel.

Montreal, 1st Wednesday, Queen's Hotel.

New England, 3rd Thursday, Puritan Hotel, Boston.

New York, 1st Thursday, Brass Rail, 100 Park Ave.

Northwestern, 1st Friday, St. Paul Town and Country Club.

Pacific Northwest, Annual Meetings only.

Philadelphia, 3rd Wednesday, Engineer's Club.

Pittsburgh, 1st Monday, Fort Pitt Hotel.

St. Louis, 3rd Tuesday, Forest Park Hotel.

Southern, Annual Meetings Only.

Toronto, 3rd Monday, Diana Sweets, Ltd.

Western New York, 1st Monday, 40-8 Club, Buffalo.

New Scholarship Awards Announced By American Can

Seven four-year college scholarships were awarded this year by American Can Company, making a total of 15 awarded since the firm inaugurated its program last year.

Award certificates were presented in April to six children of employees and one young employee, in Canco's four geographical divisions.

Candidates for scholarships must be sons or daughters of can company employes with at least five years accredited service with the firm. Also eligible for scholarships are employees under 23 years of age who have worked for the company one year or more.

In addition to the tuition, Canco makes a contribution of $500 a year to the selected institution for each student enrolled under the scholarship program.

EXTENDER PIGMENTS

(*From page 29*)

size distribution to fit in with his individual formulation requirements.

Kaolin is produced either by an air flotation process or by a water process. If uniformity is the main consideration, the water process should be chosen. Better control can be exerted over every significant variable in the water processing system.

The discussion continued with the effect of particle size distribution of kaolin in a latex paint system. Paints containing kaolin with a particle size 80% finer than 2 microns showed a sharp increase in gloss, a sharp increase in viscosity, an upward swing in contrast ratio and an increase in washability and stain removal.

With the panel discussion concluded, the meeting was thrown open for a question and answer period.

COLOR MATCHING

(*From page 33*)

The panel sprayer is also suited to produce accurate duplication of film thicknesses for exposure, salt spray, chemical tests, etc.

Operation

The panel sprayer is placed in, or in front of, a spray booth. For the air operated unit only a hose from the main line air supply need be attached. The electric unit requires an explosion proof electrical connection.

Any standard make hand spray gun may be used. The gun is locked to the bracket with a thumb screw. The distance between the gun and the panel may be varied but remains at the set readable distance until moved. In like manner, the gun height and angle to the panel may be changed when desired.

When the gun is directed as desired, a panel is placed on the carrier, the machine is turned on, and the panel begins to reciprocate at a constant speed in front of the gun. The operator depresses the trigger for one or more passes according to the requirements.

Electric units have eleven combinations of change gears for control of panel speed, and a magnet bracket to hold the panel. The air operated unit is driven by compressed air, instead of an explosion proof electric motor, and the speed of traverse is read directly from a tachometer calibrated for inches a minute. The panel is held by a pair of Venturi-operated vacuum cups. The air operated unit is so light that one man can lift it from one spray booth to another.

Although the machines are designed primarily to permit duplication in coating application, they also nearly parallel hand spray procedure, the results being practically identical, and generally simulate automatic operation exactly.

CABOT COLORING BLACKS
for paint
ALL GRADES FOR ALL PURPOSES

Grades of Paint Blacks PELLETIZED	Fluffy	Nigrometer Scale (Color Value)	Particle Diameter mμ	Surface Area M^2/gram	Volatile Matter %	Lbs/100 Lbs. Black Oil Absorption	Tinting Strength %
STERLING S	Sterling R	99	80	20	1	65	100
STERLING V	Sterling VR	96	60	30	1	100	95
STERLING LL	Sterling 92R	95	50	35	1	70	140
STERLING 10	Sterling 10R	94	47	40	1	145	120
STERLING 99	Sterling 99R	93	45	52	1	80	150
BLACK PEARLS 81	Monarch 81	81	22	120	5	85	184
BLACK PEARLS 74	Monarch 74	74	17	300	5	95	185
BLACK PEARLS 71	Monarch 71	71	15	380	5	100	172
	*Supercarbovar	69	14	400	5	110	170
BLACK PEARLS 46	Carbolac 46	65	13	750	14	125	155
BLACK PEARLS 2	Carbolac 2	64	12	850	12	135	155
	*Carbolac 1	58	9	920	17	160	155

*Supercarbovar and Carbolac 1 are offered in fluffy form only.

For samples and further technical information, address

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Special Blacks Division
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SUSPEND PIGMENT in oil stain rapidly, safely—with an air-driven LIGHTNIN Portable Mixer. One of 30 portable models—electric or air driven—in sizes from ⅙ to 3 HP.

Put all the power right into the batch

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You can save power mixing with LIGHTNIN Portable Mixers—because power is used only when the individual batch is being mixed.

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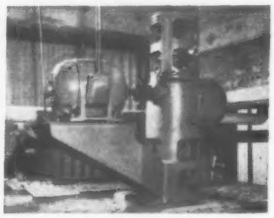

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Effect of Lecithin

(*From page 2*)

initial pH of the same paints when they were compounded. The pH stability is very satisfactory.

Paint Specimen	pH	Initial pH
A-O-A	10.8-10.9	10.80
A-I-A	10.85	10.85
A-II-A	10.3-10.4	10.30
A-III-1	10.7	10.70
A-III-2	10.9	10.90
B-O	10.9	11.02
B-I	10.2	10.30
B-II	10.3	10.20
B-III-1	10.7	10.70
B-III-2	10.8-11.0	10.60
A-O (Control:no lecithin)	11.0-11.1	11.10

Table 12. pH determinations made at the end of storage period of paint specimens.

Acknowledgments

The author is grateful for the active cooperation of Louis F. DeLong, Herbert M. Goldstein, and R. W. Muschett, Jr.

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DR. J. S. LONG TO PRESENT SIXTH MATTIELLO LECTURE

Dr. J. S. Long, Educational Director of Devoe & Raynolds Co., Louisville, Ky., will present the Joseph J. Mattiello Lecture at the annual meeting of the Federation of Paint and Varnish Production Clubs to be held at the Palmer House, Chicago, Ill., November 18, 19, 20, 1954.

Dr. J. S. Long

Because of his outstanding work in research Dr. Long was voted one of the outstanding scientists in the Paint, Varnish, and Plastics field by the Chicago Section of the American Chemical Society in 1947. In 1952 he was elected a Fellow of the Royal Society of Arts in England. In the same year he was appointed "Distinguished Professor" at the University of Louisville.

He has been an active and enthusiastic worker with both the Educational and Research Committees of the Federation. In 1943 he conceived the idea of a coordinated program for the Federation on the subject of "Film Formation—Film Properties—and Film Deterioration." This was adopted by the Federation and has been under study for the past 10 years.

In June, 1949, Dr. Long represented the Federation at the Industrial Fair at Basel, Switzerland and at the Conference of the Oil and Colour Chemists' Association at the Isle of Bute, Scotland. He presented a paper on "Film Formation" at both of these meetings.

He served in the Chemical Department at Lehigh, as assistant instructor, assistant professor, associate professor, and professor of chemistry. He also served as chemist and consultant.

In 1927 he organized a cooperative research agreement between Lehigh University and several interested firms to further study the fundamentals of oil chemistry.

He is co-author of several technical books.

Dr. Long is a Fellow of the American Institute of Chemists. He is a member of Theta Xi, Tau Beta Pi, Sigma Xi, Omicron Delta Kappa, Society of Chemical Industry of England, Textile Chemists Association, American Oil Chemists Association, American Concrete Institute, and American Chemical Society. He is also a Past Chairman of the Lehigh Valley Section of the American Chemical Society and the Paint and Varnish Division of ACS.

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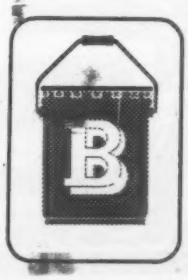

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Information on grinding time, fineness, tint strength, cryptometer readings and other technical data, where applicable, is listed.

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ENAMEL CALCULATOR

Revised coal tar base enamel quantity calculator has been produced by Reilly Tar & Chemical Corporation, 1615 Merchants Bank Building, Indianapolis 4, Ind.

Calculator gives estimates for quantities of enamel required in pounds per thousand feet and gallons per mile on two grades of Primer. It also gives estimates for coupling compounds required for mechanical couplings on pipe of normal size from 2" through 48". On the reverse side of the calculator, a Mannheim type slide rule is available for multiplication, division, etc., covering the calculations needed to estimate the total amount of material required on any pipline coating job.

ULTRAVIOLET ABSORBERS

Antara Chemicals, Sales Div. of General Aniline and Film Corp., 435 Hudson St., New York 14, N. Y., has recently issued a 20-page booklet covering the use of ultraviolet light absorbers, "Uvinuls." Of interest to coating manufacturers, is the section which discusses the use of these chemicals as an effective agent when used in coatings for materials that are subject to discoloration or deterioration in properties on exposure to ultraviolet radiations. Composition and properties of these materials are covered including compatibility, absorption characteristics, stability, and color. A detailed discussion on the spectrum is also presented.

PAINT ADDITIVES

Raybo Chemical Company has available their new Technical Bulletin A containing information on AntiSilk for the elimination of silking and floating; AntiSag to stop sagging, retard settling and improve dispersion: FloInducer which promotes leveling: Spangle to improve aluminum paint: Mar-Hard which makes baked finishes scratch proof: Disperse with which water thinned paints can be made easily by mixing alone: AlGel to make gels of aluminum octoate in mineral spirits without heat and Rustib which stops rusting. Raybo Chemical Co., Huntington, W. Va.

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Booklet issued by The New Jersey Zinc Company, manufacturers of zinc oxide and sulfide pigments, illustrates its modern method of shipping 50-pound bags of pigment from its Palmerton, Pennsylvania, smelter. Pioneered and developed by the Company several years ago, this method is said to save its customers up to 33% in handling costs.

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ORGANIC ACIDS

"Organic Acids (F-4768)" has recently been published by Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, 30 E. 42nd St., New York 17, New York. This booklet discusses in detail the eight organic acids that are sold in commercial quantities by the Company (acetic, butyric, 2-ethylbutyric, caproic, 2-ethylhexoic, crotonic, sorbic, and succinic acids). It tells of their uses in many industries, and gives their physical properties, specifications, shipping data, and constant boiling mixtures. The sections on physical properties and specifications will be helpful in suggesting uses, and in determining proper handling and storage procedures. Selected references are included.

An important feature of this booklet is an entire section devoted to the specifications and test methods used by Carbide for its organic acids. These laboratory control tests comprise some of the standard A.S.T.M. methods, as well as new methods that have been specially developed by the Company's own laboratories.

ACRYLIC EMULSION

"Rhoplex AC-33", acrylic resin emulsion for water base paints, is presented in this 18-page booklet. Properties of this resin emulsion are covered together with complete information and data on the manufacture and formulation of water paints based on this particular emulsion. Other application for "Rhoplex AC-33" other than in the formulation of interior paints, are also covered. Copies of this bulletin may be obtained by writing to Rohm & Haas Co., The Resinous Products Div., Philadelphia 5, Pa.

FLAT WALL ENAMELS

Technical Data Sheets give formulation of white flat wall enamels based on Rezyl Resin 405-18 (in low-odor mineral spirits) and Rezyl Resin 406-22 (in odorless mineral spirits). American Cyanamid Co., Plastics & Resins Div., 30 Rockefeller Plaza, New York 20, N. Y.

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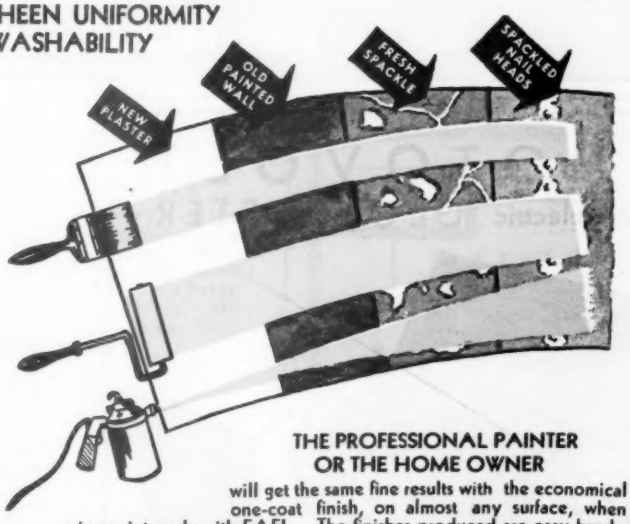

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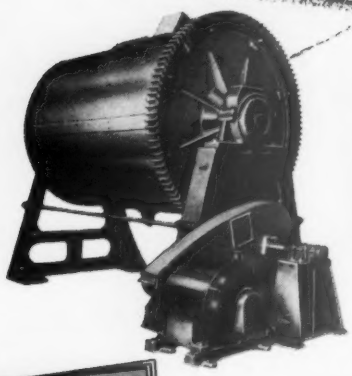

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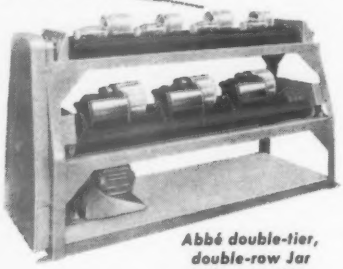

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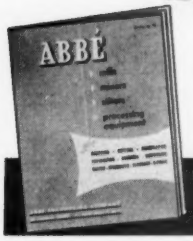

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Elizabeth Burris-Meyer, noted color consultant is associated with Mr. Eldot.

House Sub-Committee Acts on Paint-Making Report

The House sub-committee on intergovernmental relations has approved a report on Government paint-making activities, according to Congresswoman Cecil M. Harden. The report will be taken up by the parent House Governmental Operations Committee at its next meeting.

The paint-making report is the first issued by the Harden sub-committee on specific industrial-type operation by Government following issuance last February of the full committee's report on Government in business.

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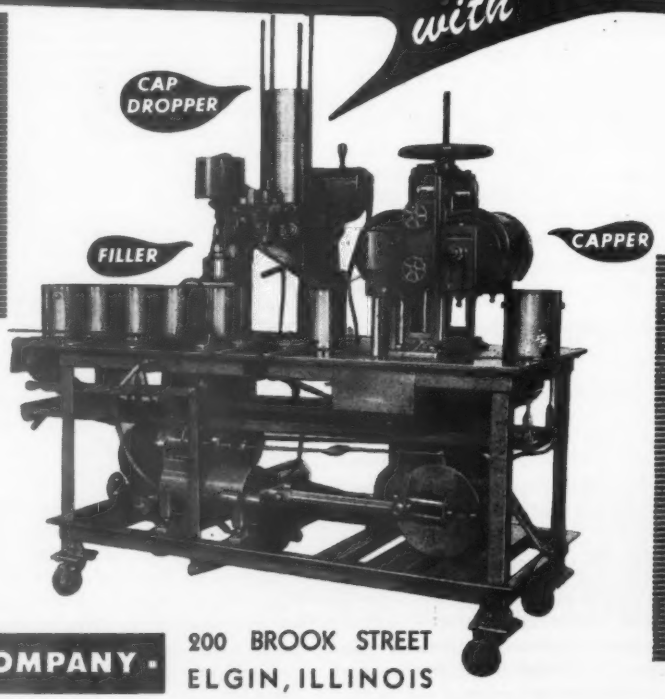

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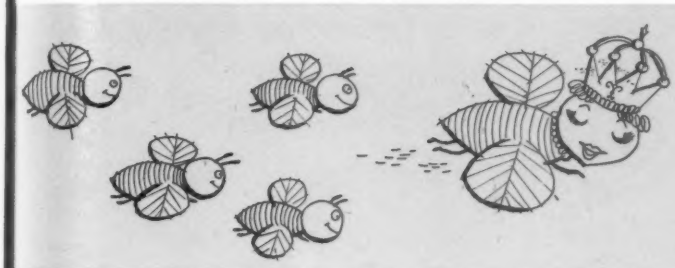

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Acid Number, Solid Resin, Max.	1
Pounds per Gallon, Approx.	8.5

*Pounds of Hydrocarbon Solvent mixture (76.4% Pure Grade n-Heptane and 23.6% C.P. Toluene, by weight) tolerated by 100 pounds of Resin Solution.

QUALITY • UNIFORMITY • SERVICE
assured by intensive research, rigid control, prompt delivery

AMERICAN Cyanamid COMPANY
PLASTICS AND RESINS DIVISION
30 Rockefeller Plaza, New York 20, N. Y.

In Canada: NORTH AMERICAN CYANAMID LIMITED
Toronto & Montreal

HYDRITE FLAT has what it takes for a good extender pigment

- COMPATIBILITY
- DISPERSABILITY
- SUSPENSION STABILITY
- INERTNESS
- LOW PRICE

FLAT

For *latex* emulsion paints, particularly, **HYDRITE FLAT,** newest of the hydrated aluminum silicates, fills the specifications for a good flatting agent. It permits high pigment volume concentration while maintaining good film integrity. It is non-reactive and the basic material is carefully selected and processed to reduce soluble salts to a minimum. It is notable, also, for its dispersability and its ability to remain in suspension.

In every way **HYDRITE FLAT** possesses the desirable characteristics of an extender pigment, both in process and in use. And it imparts a desirable degree of flatness that is unsurpassed by any materials of this type.

Send for sample and further information.

HYDRITE FLAT

CHEMICAL PROPERTIES: Hydrated aluminum silicate. Non-reactive toward either acids or alkalies. Controlled low soluble salts.

COLLOIDAL PROPERTIES: Readily deflocculated by common dispersing agents, e.g., caseinates, polymerized phosphates, etc. Compatible with both aqueous and non-aqueous vehicles.

GEORGIA KAOLIN COMPANY
433 North Broad Street, Elizabeth, N. J.

HYDRITE FLAT